

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

DIESEL PROGRESS



FIVE DOLLARS PER YEAR

MARCH, 1956

FIFTY CENTS PER COPY

Comparison Proves Texaco Best for diesels at Vero Beach, Florida, power plant

The entire power plant at Vero Beach, Florida—including five diesels totaling over 12,000 h.p.—has been 100% Texaco-lubricated for the past two years. This confidence in Texaco began when *Texaco Ursa Oil* was tested against a leading competitive brand. Says Superintendent of Power Plant Fred Gossett:

"*Texaco Ursa Oil* definitely showed a superior ability to keep our diesels clean and free from deposits, prevent stuck rings and valves, reduce wear. We decided on *Texaco Ursa Oil* for all our diesels, and have been more than satisfied with the results—higher engine efficiency, lower fuel and maintenance costs."

Operators everywhere enjoy similar benefits. In fact—

For over 20 years, more stationary diesel h.p. in the U.S. has been lubricated with Texaco than with any other brand.

The complete line of *Texaco Ursa Oils* is especially refined and processed to assure *more power with less fuel over longer periods* between overhauls—for all diesel, gas and dual-fuel engines.

A Texaco Lubrication Engineer will gladly help you select the one best suited to *your* engines. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

DIESELS at the city power plant, Vero Beach, Florida. Three Nordberg and two McIntosh-Seymour engines—plus all plant auxiliaries—are 100% Texaco-lubricated.

TUNE IN:
TEXACO STAR THEATER
starring
JIMMY DURANTE
on TV Saturday nights.
METROPOLITAN OPERA
radio broadcasts
Saturday afternoons.

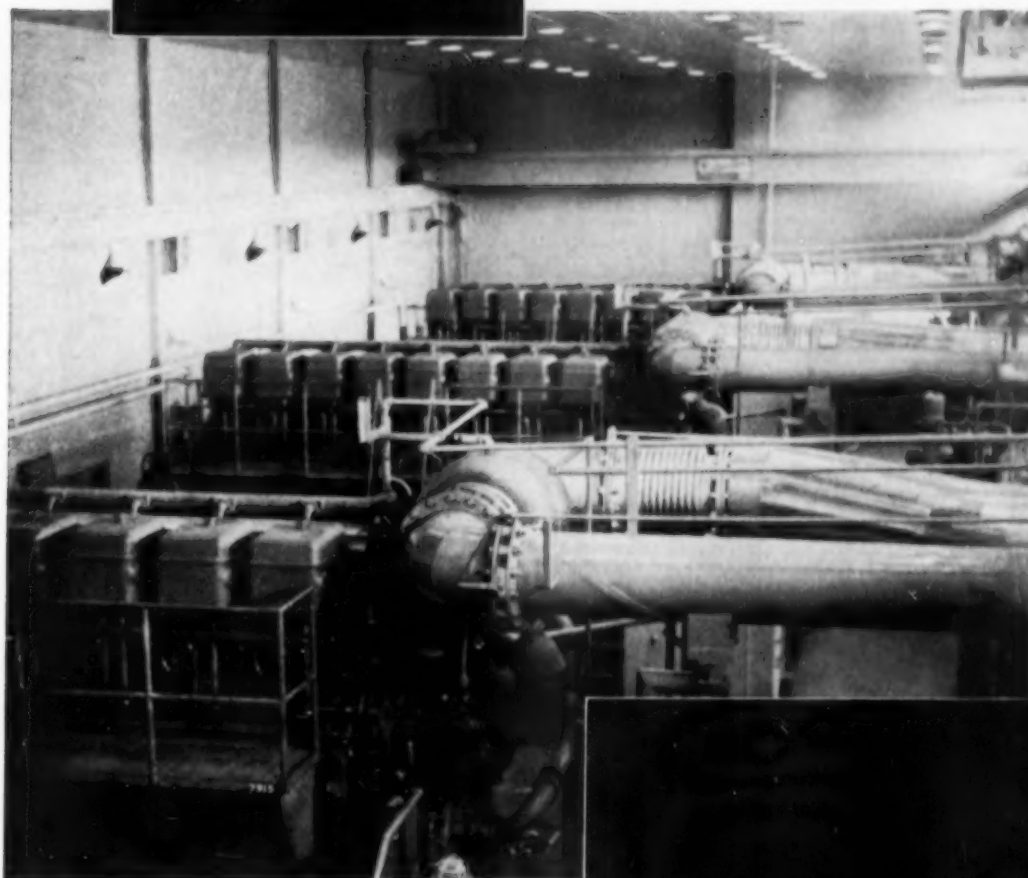


TEXACO

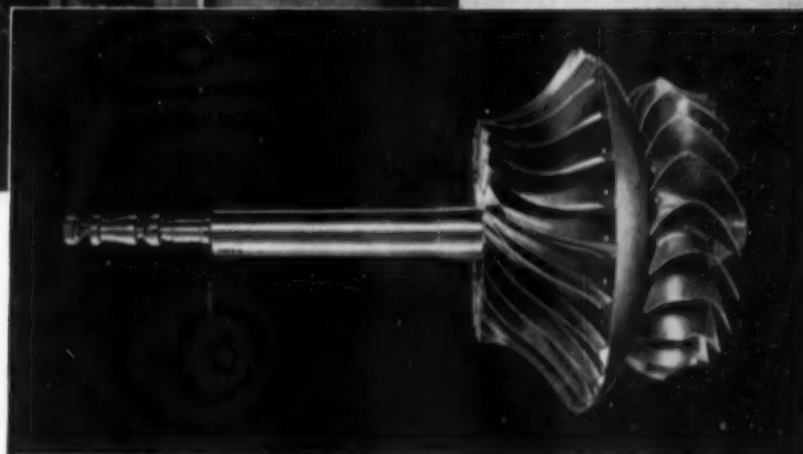


DE LAVAL
HIGH PRESSURE
TURBOCHARGERS

*efficiently serve diesels
at Lakehead Pipe Line Company*



Exclusive
MONOROTOR
Construction



Located in an outlying district in Northern Minnesota, this oil pumping station of the Lakehead Pipe Line Company must have *dependable, efficient* equipment. That's why Nordberg Diesel engines with *De Laval High Pressure Turbochargers* were chosen for this service.

The De Laval turbochargers efficiently utilize the exhaust gases to supply the high intake air requirements of these 1800 BHP, eight cylinder, four-cycle Supairthermal engines. Shown in the photograph are three units. Six other identical engines operate in pairs in three other stations of this company.

Due to the exclusive Monorotor design, De Laval High Pressure Turbochargers have a pressure ratio up to 3:1, as well as far higher pressure and turbine efficiencies than those found in conventional turbocharger systems. They are self-adjusting to engine loads, can be used with 4- and 2-cycle engines.

Write for De Laval Bulletin 8000 giving comprehensive curves and flow range diagrams.

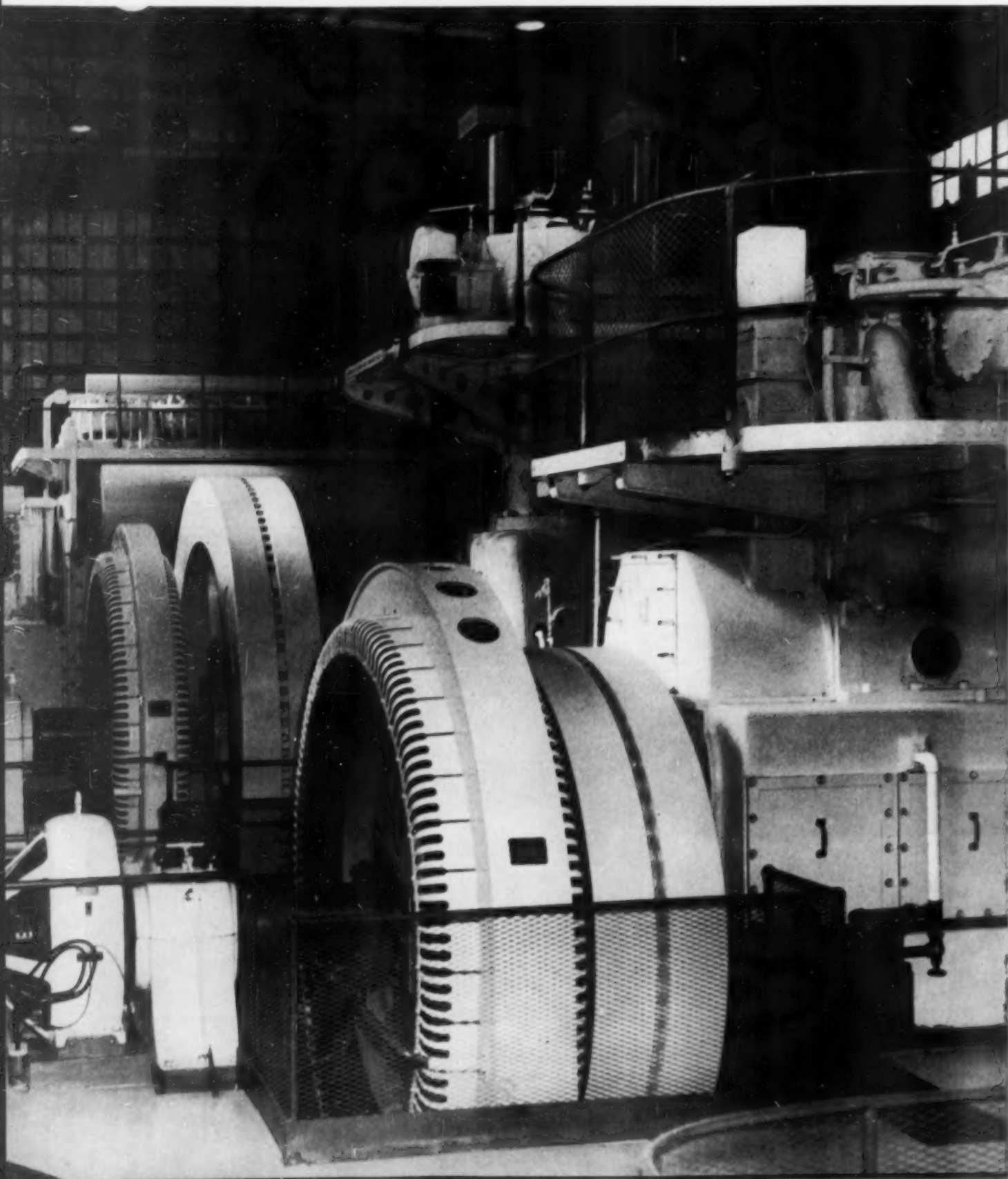


DE LAVAL Turbochargers

DE LAVAL STEAM TURBINE COMPANY

883 Nottingham Way, Trenton 2, New Jersey

DL 224



URSA OILS FOR ALL DIESEL, GAS
AND DUAL-FUEL ENGINES

DIESEL *and* GAS ENGINE PROGRESS

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IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

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EDITORIAL AND PRODUCTION OFFICES

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BUSINESS OFFICES

ROCKVILLE CENTRE, N.Y.:
Robert K. McQuiston
59 Front Street
Rockville Centre 6-6344

CHICAGO 2:
Bruce Wadman
30 No. La Salle St.
DEarborn 2-3533

LOS ANGELES 46:
Sidney Hoffman
816 N. La Cienega Blvd.
OLEander 5-7410

LONDON E.C. 4:
G. L. Fetherstonhaugh
St. Paul's Corner
Ludgate Hill

TULSA 3:
O. F. Cozier
305 Daniel Bldg.
GIBson 7-5555

FIELD EDITORS

HIALEAH, FLA.:
Edwin Dennis
250 W. 50th St.

YORKTOWN HEIGHTS, N.Y.:
Arnold B. Newell
R.F.D. #2

LOS ANGELES 46:
James Joseph
8421 Melrose Ave.

NEW ORLEANS 12:
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330 International Trade Mart

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**DIESEL
PROGRESS**



FRONT COVER ILLUSTRATION

The diesel tug *Barney Turecamo*, latest addition to the Turecamo New York Harbor fleet. Power is by a GM Cleveland Diesel Model 1628A, developing 1600 hp at 750 rpm.

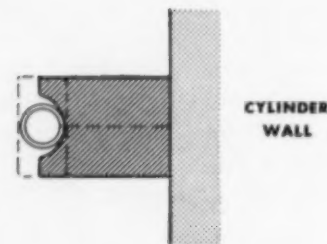
"COOKTITE"

identifies the **C. LEE COOK** family
of Quality Sealing Rings!

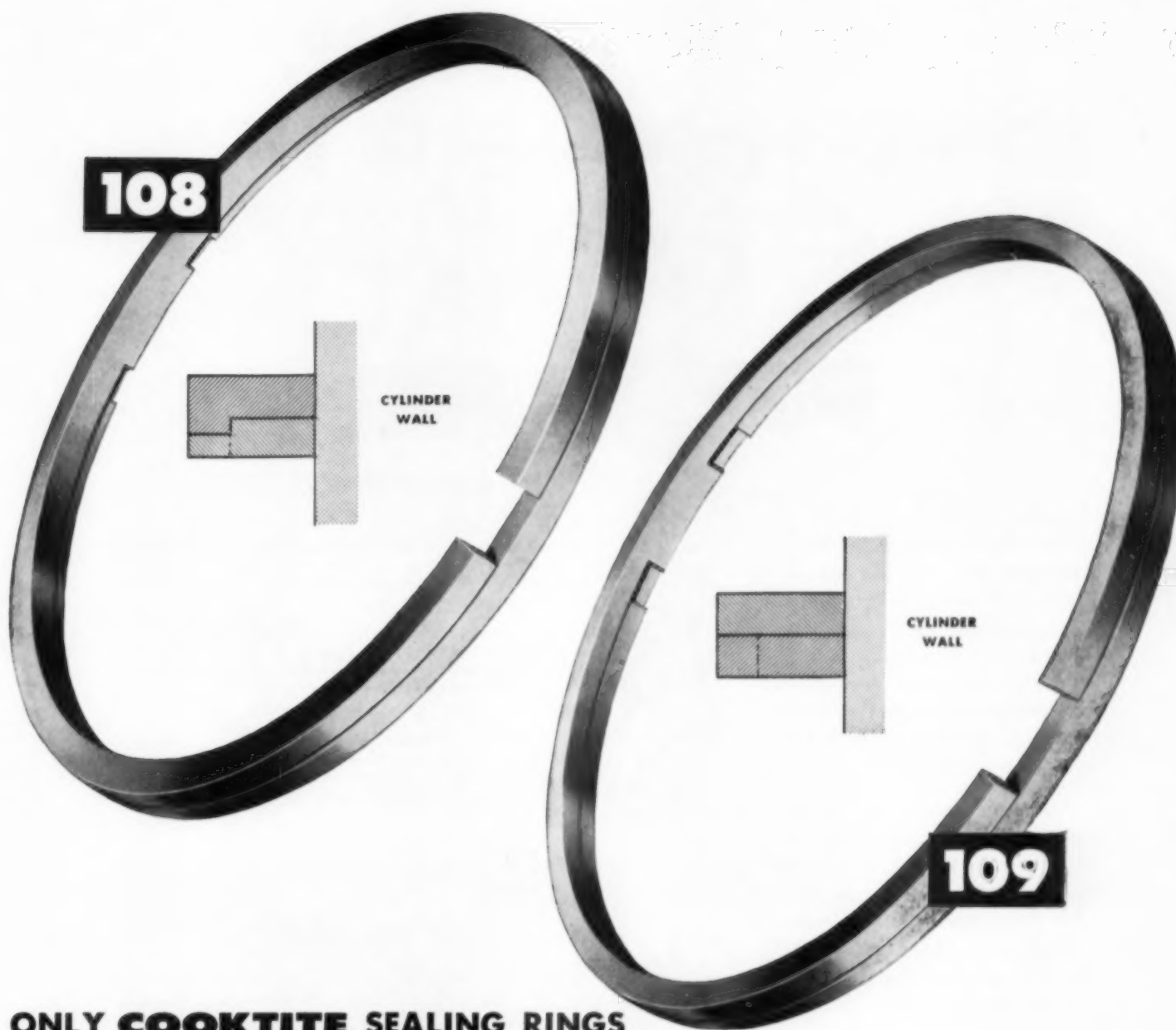
TAKE your choice — 108, 109, 301-1X — they're all Cooktites! Each is a great piston ring in its own right. All are products of one manufacturer — the C. Lee Cook Company. Which rings you select will be dictated by the nature of the service, but whatever your choice, of this you can be certain — if it's a Cooktite you'll get a perfect seal *every time, all the time*. That's a promise from the pioneers in industrial piston ring design and development — the C. Lee Cook Company.

Mail the coupon (at right) direct to Louisville for complete engineering data, and specific recommendations for your units. No obligation, of course!

301-1X



Look to **COOK** for Better Rings!



**ONLY COOKTITE SEALING RINGS
GIVE YOU ALL THESE ADVANTAGES!**

- Insure perfect cylinder seal, thereby preventing blow-by which destroys lubricating oil film!
- Decrease rate of cylinder wear!
- Have special joint construction which eliminates compression leak characteristic of plain rings!
- Restore new engine power and performance to worn cylinders!
- Reduce fuel consumption in tapered cylinders!
- Assure long effective ring life due to superior materials!

**C. LEE
COOK**

COMPANY

Sealing Pressures Since 1888

.....

● C. Lee Cook Company
976 South 8th Street
Louisville 3, Kentucky

● Gentlemen: Please send me complete information on Cook Piston
Rings and name of nearest representative.

● Firm _____

● Street _____

● City _____ State _____

● Attention: _____

● Type of Units _____

cut your diesel maintenance costs with



PUROLATOR

in these three spots

Even the cleanest fuel supply brings damaging dust, dirt and grit into your diesel engine. Without filtration, injection pumps gall, wear and lose their accuracy. Nozzles get plugged and burn. Even if your engine goes on running, the power output of individual cylinders goes badly out of balance.

So . . . effective fuel oil filtration is absolutely essential. For your engine to keep running at peak efficiency and with minimum outlay for maintenance, its fuel system should be equipped with PUROLATORS in the three areas listed at the right.

For details of the PUROLATOR models designed for use in these diesel applications, write today for the PUROLATOR diesel catalog. Address Purolator Products, Inc., Rahway, N. J., Dept. DP1-310.



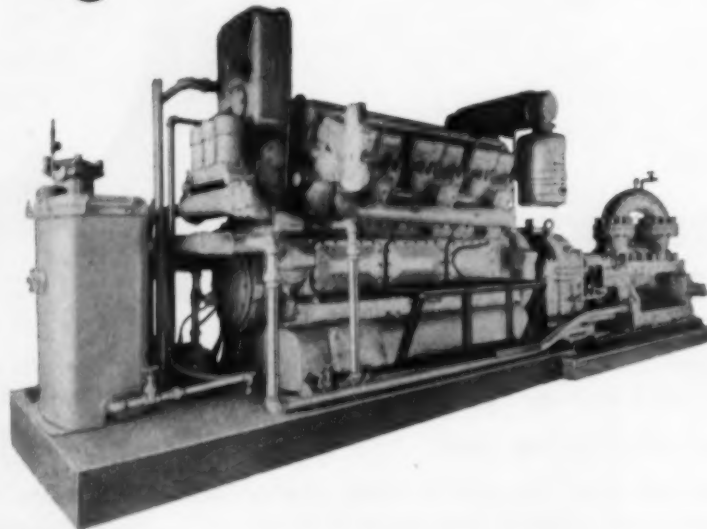
Immediately before and after the transfer pump. The PUROLATOR on the suction side protects the pump. The one on the pressure side takes out any bits of metal worn from the moving pump parts.



In the fuel line before the injection pump. A PUROLATOR here is an inexpensive way to assure smooth, wear-free operation of the injection pump.



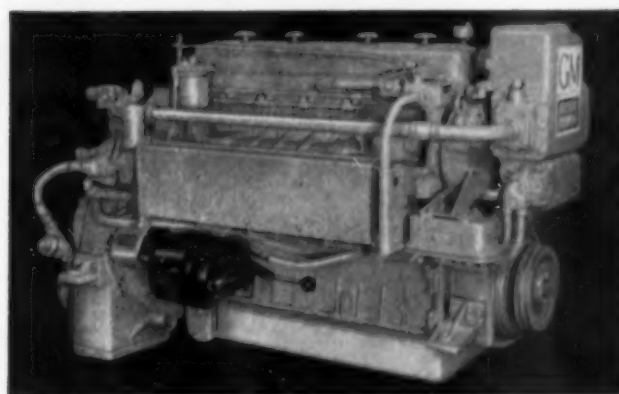
Built into each injection nozzle. While there is no obvious source of contamination beyond the injection pump, experience shows that an individual metal-edge filter element built into each nozzle assembly vastly improves nozzle life expectancy.



PUROLATOR PRODUCTS, INC., Rahway, New Jersey



HAND-CRANKED INERTIA STARTER



Performance proved on thousands of diesel- and ignition-fired marine and industrial engine installations.

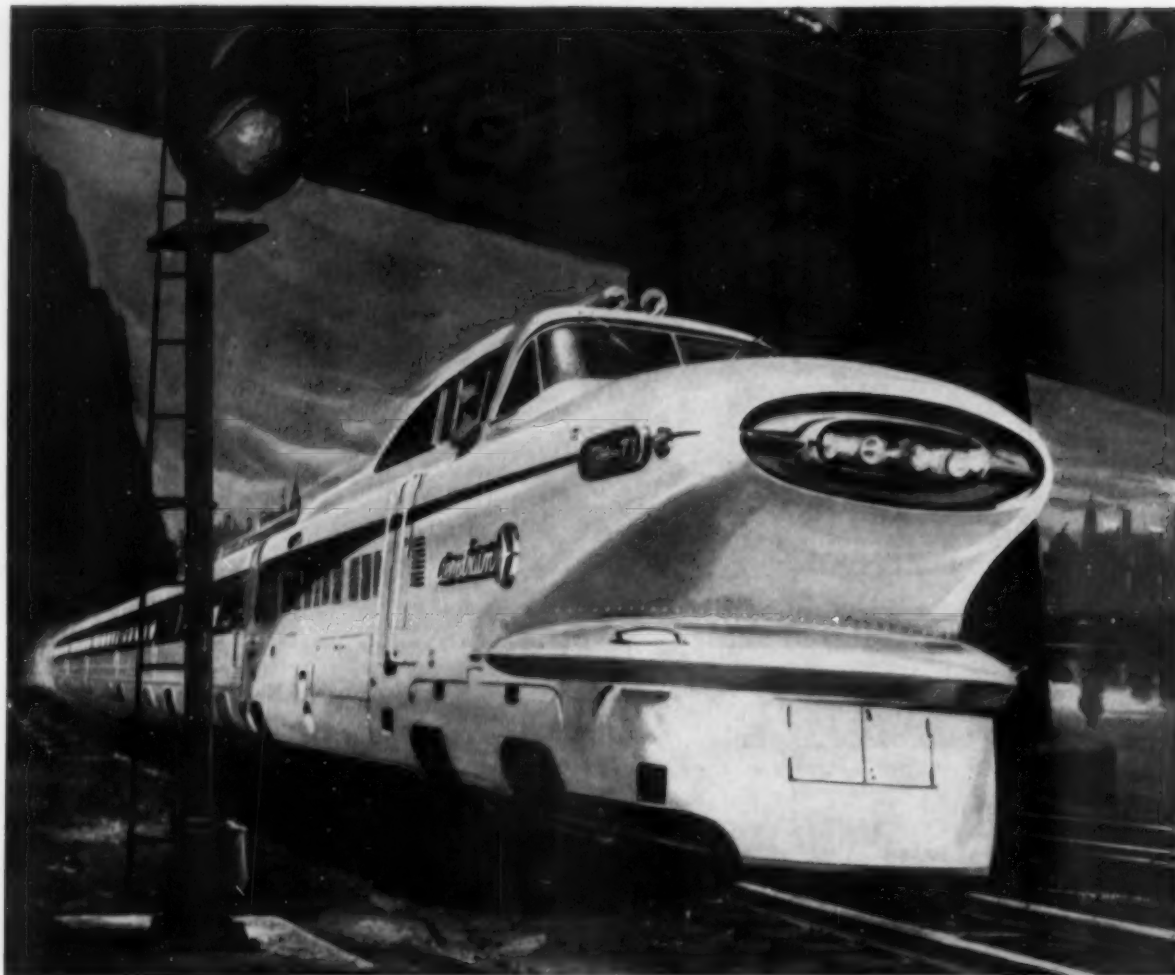
To low installation cost, add rugged, simple design and dependable operation. Then you have the explanation of why the Bendix AE hand-cranked inertia starter is in such big demand by men in the oil, marine, construction, agriculture and mining fields. Particularly in remote areas and under difficult operating and climatic conditions, this starter fills a very real need. For full details write BENDIX INTERNATIONAL, DIVISION OF BENDIX AVIATION CORPORATION, 205 East 42nd Street, New York 17, N.Y. Cable: "Bendixint", N.Y.

COSTS LESS TO INSTALL

HERE'S WHY:

- Requires NO CABLES, NO PUMPS, NO PLUMBING
- More easily mounted and in more positions
- Can be installed in ten minutes without the use of any special tools
- Completely self contained . . . no "extras" to buy





NEW HORIZONS IN RAIL TRAVEL

The two new lightweight General Motors Aero-trains are now touring American railroads. This great Electro-Motive development opens new horizons that might well revolutionize travel by rail. With steel underframe and aluminum body, the high-speed Aerotrain is 50% lighter than

conventional trains. It costs much less to build and much less to operate.

It is Electro-Motive's current contribution to the thinking designed to win passenger traffic for railroads—and help to make it profitable.

Electro-Motive Division

GENERAL MOTORS • LA GRANGE, ILLINOIS

Home of the Diesel Locomotive

In Canada: GENERAL MOTORS DIESEL, LTD., London, Ontario



The Engineer's Field Report

CASE HISTORY
RPM DeLo Oils
LUBRICANT
Alaska Freight Lines
FIRM *Seattle, Washington*

RPM DELO Oil protects engines of huge Arctic Sno-Freighter— even at 68° below zero



ALASKA FREIGHT LINES uses RPM DELO Oil in engines of this huge LeTourneau Sno-Freighter for operations on the first overland supply route to the Arctic Ocean. During winter months, when temperatures fall to 68° below zero, the two 400 hp. Cummins diesels run 24 hours a day to prevent freezing. After a year of such service, crew members report RPM DELO Supercharged-1 Lubricating Oil proved completely satisfactory for all weather and performance conditions.

Using "RPM" and "RPM DELO" lubricants, exclusively supplied on the job, giant six-car train hauls 200-ton loads over 600 miles of frozen tundra from Circle, Alaska, to the Beaufort

Sea. Decks of Sno-Freighter are 8½ feet off the ground, with all cars waterproofed to a height of six feet for fording streams. Engines drive generators which supply current to electric motors inside each of the 24 wheels. Operator steers only two front wheels; each unit automatically tracks car ahead.

Why RPM DELO Oils prolong engine life

Special compounds stop corrosion

Anti-oxidant resists lacquer formation

Detergent keeps all parts clean



Metal-adhesion qualities keep oil on parts in running or idle engine—inhibitor resists foaming



TRADEMARK "RPM DELO" AND DESIGN
REG. U. S. PAT. OFF.

For More Information about this or other petroleum products of any kind, or the name of your nearest distributor, write or call any of the companies below.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado



• REPORT FROM JUNEAU, CAPITAL CITY OF ALASKA



Alaska City Relies on Enterprise Engines for Dependable, Versatile, Low-Cost Power

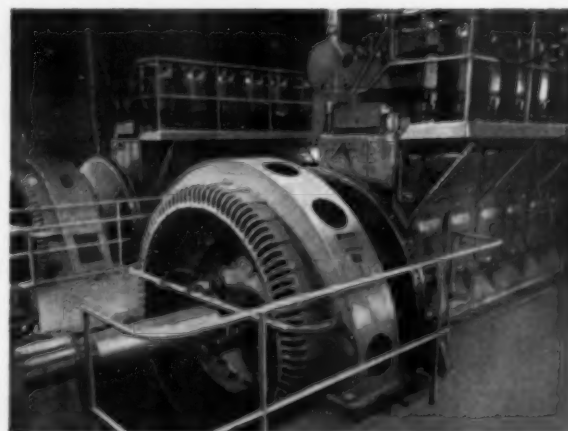
As with any community, the health and welfare of Juneau would be badly impaired if there were a prolonged interruption in electric power. That's why two modern Enterprise Diesel-electric generator sets have been installed to support the hydro-electric output in winter, and peak load periods during the summer months. With electrical demands nearly tripled since the first Enterprise Engine was installed in 1951, the second unit was ordered and placed in service early last year. This is a "twin" to the first DSQ-318 Enterprise, which had built a reputation for such excellent operation at low cost per KW of capacity.

Whether your community's need is for standby, partial load or complete utility service, Enterprise will serve you well. Get full information on Enterprise diesel, dual-fuel, tri-fuel and spark-ignited gas engine models from 73 to 7703 HP. Engines may be equipped to burn lower cost "heavy" or residual fuels if desired. Write today, or call your nearest Enterprise office for complete information.

Over 2 million horsepower at work the world over!

ENTERPRISE

dependable **ENGINES**



Two 1700 HP Enterprise Engines at this Alaska Electric Light and Power Co. plant provide economical power for sharing the base electric load with hydro units, and for peaking. Each generator set delivers 1200 KW at only 360 RPM.

ENTERPRISE ENGINE & MACHINERY CO.
Subsidiary of General Metals Corporation
18th and Florida Streets, San Francisco 10, California
Export Department, New York



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TWINSURANCE



FOR ALL DIESELS

FRAM WATER SEPARATOR AND FUEL FILTER REMOVES ALL WATER—TRAPS DIRT AND DUST!

A FRAM Water Separator and Fuel Filter will give your fuel injectors complete protection by:

1. Removing *all* water to save injectors from pitting and corrosion!
2. Trapping dangerous dirt to end abrasive action once and for all!

For longer life, less wear, fewer repairs—guard *each* diesel with a FRAM Water Separator and Fuel Filter! For complete details write to: FRAM CORPORATION, Providence 16, R.I. or to Fram Canada Ltd., Stratford, Ontario.





Woodward P G Diesel
Locomotive Governor

GOVERNOR ASSEMBLY

- Woodward diesel locomotive governors are here shown being assembled in our shop. These shop men have been thoroughly trained and are specialists of production governor assembly. Their skills guarantee the high quality and dependable performance of our governors.



WOODWARD GOVERNOR COMPANY
Rockford, Illinois

WORLD'S OLDEST AND LARGEST MANUFACTURER OF HYDRAULIC GOVERNORS FOR PRIME MOVERS



Twin Disc Torque Converter on shovel increases cable life over 100%!



Records of Zontelli Brothers, of Ironton, Minn., owners of the JoAnn Iron Mine, show replacement of *seven sets* of cable on a shovel equipped with straight mechanical drive—while replacing only *three sets* on one driving through a Twin Disc Torque Converter . . . a substantial reduction in down time, *plus* increased cable life of *over 100%*.

According to Al Fox, Master Mechanic, "considering the cost of down time in replacing cables—plus the cost of cable itself and the actual labor involved in replacing them, the Twin Disc Torque Converter saves us a lot of money."

Both these Model 54-B Bucyrus-Erie 2½-yd. shovels are used to load trucks with iron ore from the open pit mine, where it is then hauled to the washing and crushing plant and

processed. One shovel is powered by a diesel engine, with direct mechanical drive—and the other is equipped with a Caterpillar D337 Diesel, working through a Twin Disc Model CF Torque Converter.

In over-all comparisons, the torque converter-equipped shovel increases production, consumes less fuel, and substantially reduces maintenance costs wherever it is used.

For *automatic* matching to load demands, with torque multiplication up to *six times* . . . for *cushioning out* overloads, shock loads and vibrations . . . *specify* Twin Disc Torque Converters for *your* shovels. *Increase* production and cable life—*reduce* fuel and maintenance costs. *Get all the facts.* Write *today* to Twin Disc Clutch Company, Hydraulic Division, Rockford, Illinois. Request Torque Converter Bulletin 135-D.



This Model 54-B Bucyrus-Erie 2½-yd. shovel—powered by Caterpillar D337 Diesel Engine, driving through a Twin Disc Model CF Torque Converter—is loading ore from the JoAnn Iron Mine, owned by Zontelli Brothers, Ironton, Minn.




BRANCHES OR SALES ENGINEERING OFFICES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • TULSA



GENERAL MOTORS LEADS THE WAY.

TAI



You can minimize downtime

*in over-the-road service
with Delco-Remy heavy-duty
electrical equipment*

Every unit in Delco-Remy's famous heavy-duty line is designed and built to take the day-in-day-out pounding of over-the-road operation . . . to give many thousands of miles of dependable service.

For example, Delco-Remy 5 $\frac{1}{4}$ -inch diameter heavy-duty D.C. generators include such long-life features as extra-large commutator and brushes (brush life of 100,000 miles is common), ball bearings, wick-type lubrication with oilers, and forced ventilation. These generators are available, with matching regulators, in a wide variety of voltage ratings and output capacities.

Other specially designed Delco-Remy heavy-duty units include cranking motors, coils and other ignition components, and Delco long-life Extra-Duty batteries with rubber separators and Delcoloy grids.

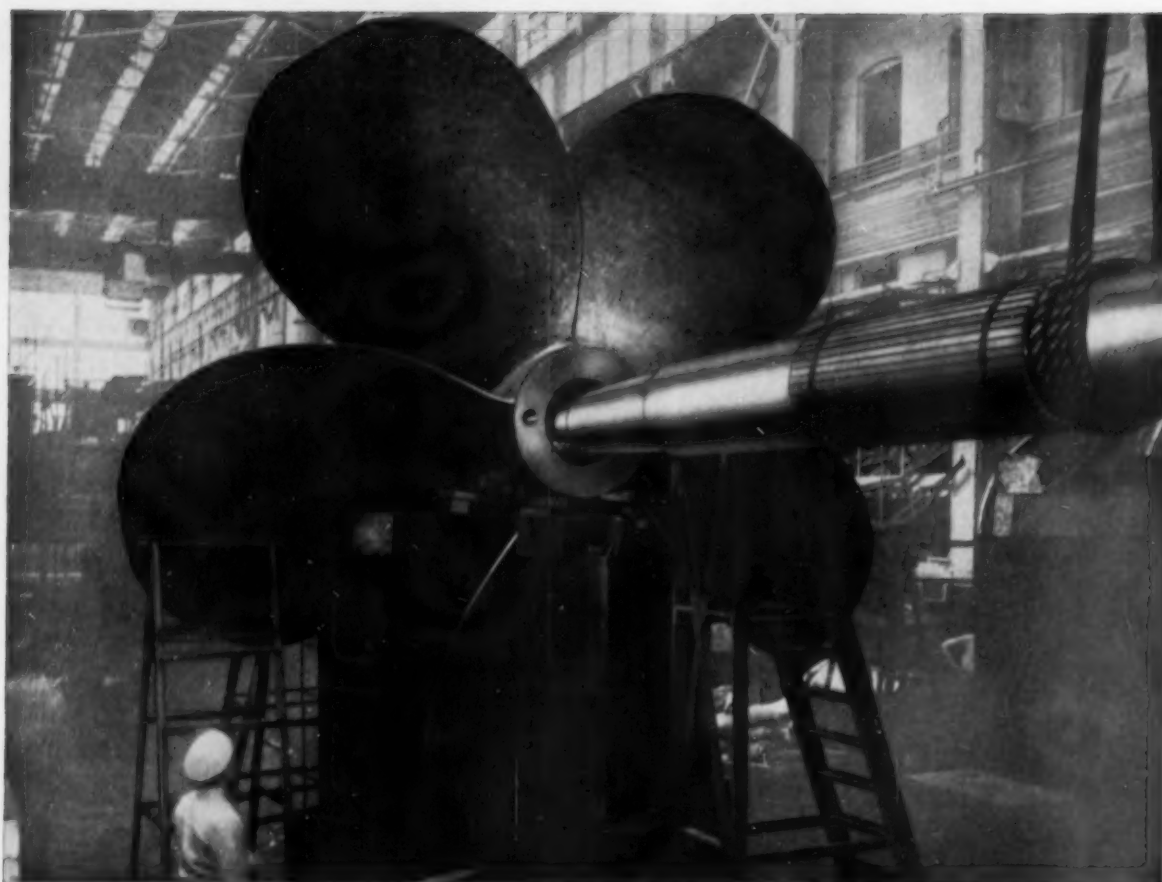
For more dependable service with minimum downtime, specify Delco-Remy heavy-duty electrical equipment when you order new vehicles or modernize your present ones. Complete details on Delco-Remy heavy-duty electrical equipment are available through your nearest General Motors car or truck dealer, or the United Motors System.

DELCO REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

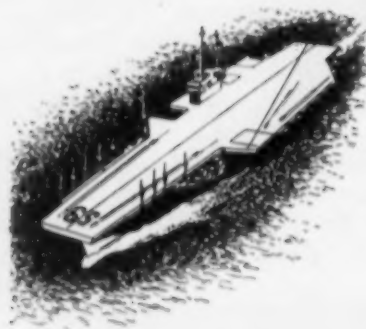
WAY.
TARTING WITH

Delco-Remy

ELECTRICAL SYSTEMS



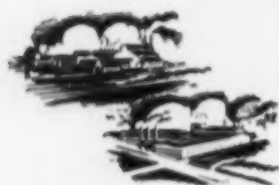
Aboard the U. S. S. FORRESTAL . . . Erie Forge Propeller Shafts

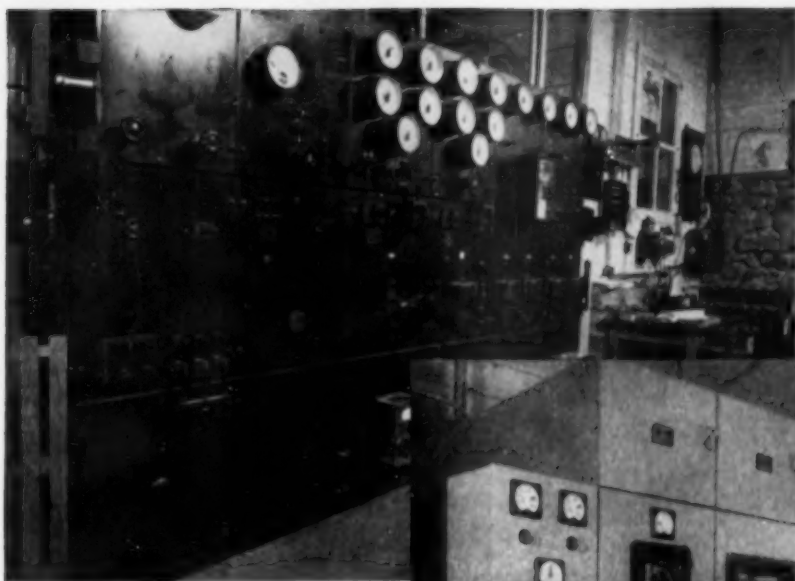


NO better example of the capabilities of Erie Forge & Steel Corporation could be offered than the one above. For many years our skilled craftsmen have made steel ingots from raw materials, transformed them into finished products to meet the demands of power transmission in wide variety . . . finished cranks, rotor shafts, drive shafts, connecting rods, a wide diversity of steel castings for industry . . . completed within the confines of one plant with one responsibility and under one control.

Consult with us on your forged steel and steel casting projects—each of us will profit.

ERIE FORGE & STEEL CORPORATION • ERIE, PENNSYLVANIA



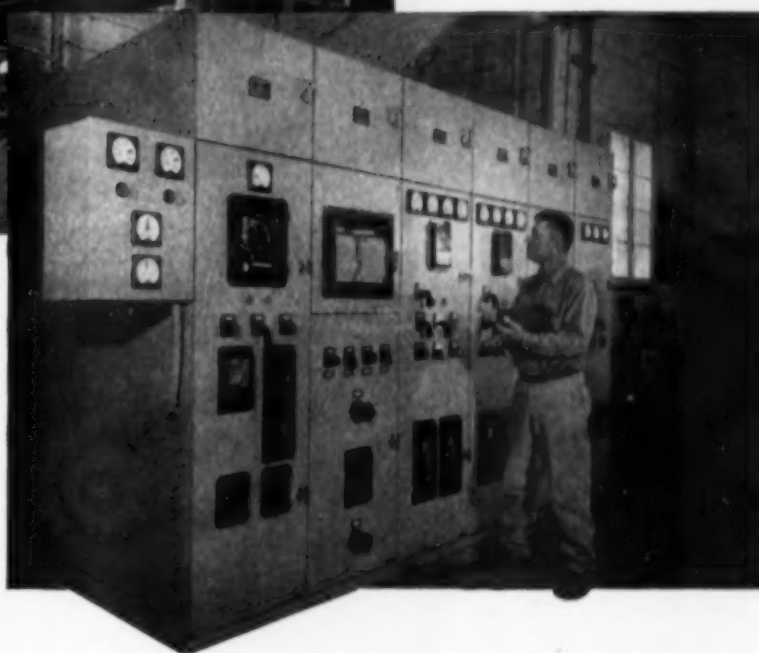


Old

Old switchgear at Big Falls, Minnesota hydroplant of Border Counties Power Cooperative, Inc. System expansions had caused this board to become dangerous by today's standards, capacity insufficient, and increasingly tedious to handle.

New

Custom-designed by E-M from standard components, this new switchgear at Big Falls gives extra safety and convenience. All apparatus is completely enclosed, yet readily accessible because of E-M's specially designed Swing-Door Instrument Panels. Operation, inspection, and testing is safe, convenient, and simple.



Making switchgear meet power system expansions

● Power systems grow larger . . . and larger . . . and larger. Electrical apparatus of all types must keep pace with this rapid expansion. The plant switchgear, with its vital safety and control functions, must be closely matched to increased demands made upon it.

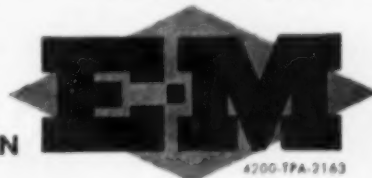
At Border Counties Power Cooperative, Inc., size of the system *tripled*. Having had previous experience with E-M's personalized engineering assistance and with the safety and service of E-M designed apparatus, they called on E-M engineers to work out the new switchgear with consulting engineers R. D. Thomas and Associates.

Equipment necessary to handle the greatly increased system had to be fitted deftly into available space. This made E-M's Swing-Door Instrument Panel a natural choice, as this panel makes use of every available inch of space, both on door and interior of cabinet. Mounted on hinges, the Swing-Door Panel opens as a door to

reveal a compact, easy-to-reach arrangement of components, all accessible without reaching across buses or terminals. The E-M Switchgear is designed for tomorrow's increased loads as well, with breakers of adequate interrupting capacity.

"Personalizing" of E-M Switchgear, as was done at Big Falls, means that each E-M board is *matched exactly* to what it will encounter in daily service. This complete, attentive, and highly specialized E-M engineering can be of service to you. Call your nearest E-M sales engineer for more facts, and be sure to write the factory for E-M Switchgear Publication No. 194.

ELECTRIC MACHINERY MFG. COMPANY
MINNEAPOLIS 13, MINNESOTA

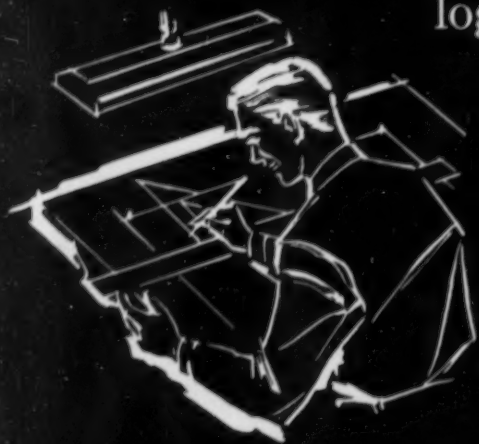


Specialists in MODERN SWITCHGEAR DESIGN

P

rogressive engineering

makes Nordberg Engines your
logical choice for power generation



Nordberg, a pioneer in the Diesel and Gas engine industry in the United States, has always occupied a prominent position among the world's leading builders of internal combustion engines. Over the many years Nordberg has contributed many of the most notable advancements in the development of more efficient prime movers all in the interest of improved fuel economy, simplicity of design, less maintenance and better overall performance.

Nordberg research, engineering and development continues to direct its efforts toward further achievements by intelligently anticipating power requirements. As a result of these efforts Nordberg today . . . with a full range of engine sizes from 10 to over 12,000 horsepower including Diesel, Duafuel® and Spark-Ignition Gas types is in the best position to solve your specific power problems.

Write for further information.

NORDBERG MFG. CO., Milwaukee, Wisconsin

A black and white photograph of a massive industrial engine, likely a diesel or gas engine, in a factory or workshop. The engine is long and cylindrical with various pipes and components. A person is standing next to it, providing a sense of scale. The background shows industrial structures and equipment.

NORDBERG

DIESEL • DUAFUEL® AND
SPARK-IGNITION GAS ENGINES

© 1956, Nordberg Mfg. Co.

P156

NO ABRASIVES

in *DAROS* Piston Rings

Abrasives, technically known as "ferrites" and "cementites" (having a diamond-like hardness), are created in ordinary cast iron from the sulphur in the fuel used by the blast furnaces when making pig iron. Most blast furnaces use coke for fuel. All coke contains sulphur—as much as 1 to 5%. The higher the sulphur content, the greater amount of abrasives that iron will contain. All piston rings made of pig iron produced by coke, therefore have a high abrasive content—Abrabives cause wear.

Here's why there is 50 to 90% less wear with DaRoS Piston Rings

There are no abrasives in DaRoS Piston Rings because they are made from pig iron produced by blast furnaces using charcoal for fuel. Charcoal is a wood product and 100% free of sulphur. Thus, DaRoS Charcoal Iron, used exclusively in making DaRoS Piston Rings contains no "ferrites" or "cementites". To retain the original high purity of the Swedish iron ore, no outside scrap iron or steel is used in DaRoS foundries. That's why DaRoS rings are better—free of abrasives. Why DaRoS users enjoy 50 to 90% slower rate of wear on rings and cylinders in new and old equipment.

Discover the BIG Difference! Just ONE Installation Will Convince You!

DaRoS Rings are like no other rings you have ever before used! Their slower rate-of-wear means less "down-time"—thousands of more operating hours before renewals and re-conditioning. What's more, DaRoS Rings do not leak! That means operating economy like never before! You actually save 10% to 15% on fuel costs! Discover the big difference DaRoS Rings can make in your equipment. Write, wire or phone for recommended application and prices now.

**IMMEDIATE DELIVERY
FROM CHICAGO
on Popular Sizes**

(This is ad #9 in a series designed to tell Diesel Operators the important story about DaRoS Swedish Iron Piston Rings)

DAROS

AMERICAN CORPORATION

D. D. Cook, President

8128 N. LAWDALE AVENUE • SKOKIE (Chicago Suburb), ILLINOIS, U.S.A.
Distributors for North, Central and South America

Dart 140-TC truck with Allis-Chalmers 8DAS-1125 supercharged diesel being loaded by a shovel powered by an Allis-Chalmers 6DCS-1879 supercharged diesel.



Fifty-five ton Dart truck powered by Allis-Chalmers 8DAS-1125 supercharged diesel dumping over edge of spoil bank that is approximately 500 ft high.

DIESEL ENGINES AVERAGE 5,000 HOURS BEFORE OVERHAULS

Allis-Chalmers Buda Division truck engines powering 24 Dart and Euclid trucks help keep production flowing smoothly at the Bagdad Copper Corp. mine under extremely demanding conditions. These trucks work two shifts a day, six days a week, hauling out both overburden and ore. The haul covers about 7/10 mile, up a grade which starts at 12 percent and quickly increases to 18 percent, with five torturous switchback turns. Thick, abrasive dust adds still further to the grueling test.

Under these conditions the Allis-Chalmers engines have averaged over 5,000 hours of operation before their first overhaul. Many of them have given more than 20,000 hours of service since 1949, and are still "going strong."

Other Allis-Chalmers engines also take a hand in production even before the hauling stage. A large shovel powered by a Model 6DCS-1879 engine has loaded out more than seven million tons of ore since June, 1949. There are Allis-Chalmers engines on the drills, compressors and dozers.

Altogether, the performance of these big, tough engines has helped hold the over-all cost of moving ore and overburden to less than ten cents a ton. It will pay you to put productive performance like this under the hood of your trucks and other units. Write for complete details and the name of your nearest Buda Division dealer.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS 

AC-1

Trucks at the Bagdad Copper Corp. mine, Bagdad, Arizona, haul overburden and ore up grades as steep as 18 percent and around five torturous switchbacks — a real test for any hauling unit and its engine.



DIGS COOL!



AND HARRISON HEAT EXCHANGERS DO THE JOB!

Harrison helps move the earth . . . by making heat bite the dust! High-powered shovels—driven by Detroit Diesel 2-cycle engines—turn in dependable, low-cost performance when Harrison's on the job controlling the heat. You'll find Harrison heat control equipment on many of the nation's leading diesels and other power equipment. For manufacturers know they can depend on Harrison—with over 45 years' experience in manufacture, design and engineering research. If you have a cooling problem, look to Harrison for the answer.



HARRISON

RADIATOR DIVISION, GENERAL MOTORS CORP., LOCKPORT, N. Y.

TEMPERATURES

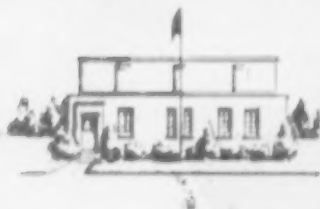
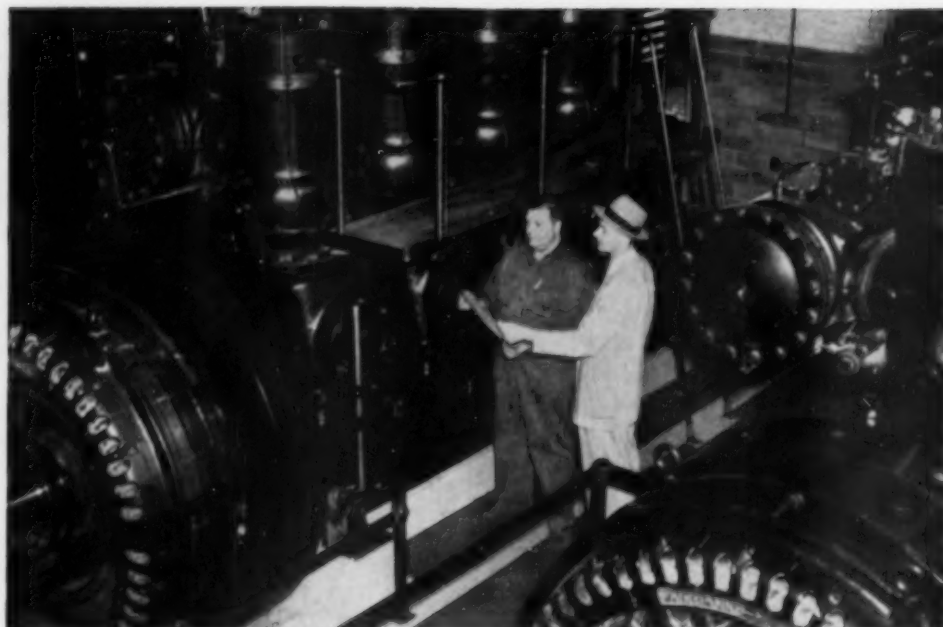
MADE

TO

ORDER



Melvin Nissen (left) plant superintendent Graettinger, Iowa, and Standard Oil lubrication specialist R. R. Spargo inspect maintenance records. Assisting customers with lubrication problems is something for which Bob Spargo is well qualified. He is a mechanical engineer with a degree from Iowa State College and a graduate of the Standard Oil Sales Engineering School. Bob has been providing lubrication technical assistance to Standard customers for nearly nine years. Customers find his experience and training pay off for them.



How STANDARD D&G Oil helped lick five problems in one plant

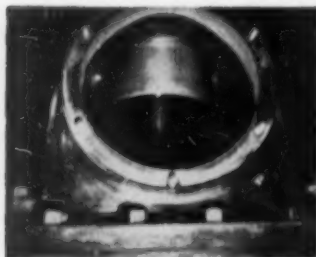
Excessive deposits, excessive maintenance, high oil consumption, were among problems solved by change-over to STANDARD D&G Oil at Graettinger, Iowa, Municipal Light Plant

Three years ago the Graettinger Municipal Light Plant began using STANDARD D&G Oil. Prior to this change-over, good engine performance was hampered by:

1. Excessive carbon deposits
2. Excessive port carbon
3. Stack fires
4. Ring sticking
5. High oil consumption

The plant averages 4.3 million HP hours of operation annually. Before changing to STANDARD D&G Oil, ports had to be cleaned several times a year. Now, with STANDARD D&G Oil in the engines, ports aren't touched between annual overhauls. Ring sticking and piston and cylinder deposits are virtually eliminated. All of this has been accomplished while continuing the use of low cetane, low gravity fuel.

Good management, careful maintenance and STANDARD D&G Oil have teamed to deliver this performance at Graettinger. Maybe you would like to use STANDARD D&G Oil to obtain similar performance from your engines. A Standard Oil lubrication specialist is nearby in any of the 15 Midwest and Rocky Mountain states ready to show you. Call him. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



Piston of one of F-M engines at Graettinger Light Plant. STANDARD D&G Oil has kept maintenance down, cut piston and liner wear.

Quick facts about STANDARD D&G OIL

- | | |
|---|---|
| 1 | Made from highest-quality solvent-refined stock. |
| 2 | Contains additives which impart superior detergent-dispersant and anti-corrosion properties. |
| 3 | Anti-foaming. |
| 4 | Oxidation resistant. |
| 5 | Recommended for use (1) with economy fuels, (2) in extreme-load and/or low temperature service. |



Standard man Bob Spargo (left) and plant superintendent Melvin Nissen inspect piston through crankcase inspection plate hole. With STANDARD D&G Oil, light plant has cut oil consumption in half.



**STANDARD OIL
COMPANY**
(Indiana)



Both Enterprise diesels aboard the dredge *Seward No. 2* have a combined horsepower rating of over 1600 hp.

FLORIDA'S NEW HYDRAULIC DREDGE

By ED DENNIS

THE largest hydraulic dredge ever built in South Florida was recently completed by Dade Drydock Co. of Miami, Florida and is now undergoing a trial working period on the coast near South Miami. Of particular interest is the part to

be played by this dredge called *Seward #2*, in the development of coastal land in Florida.

As is often the case in Florida, a lot of other wise desirable property is at such low elevation,

it is not suitable for building purposes. With the demand that exists for property fronting on the ocean and gulf, dredges are kept busy filling in low lying property and providing the solid ground necessary for home construction.



Discharge side of the 16-in. Georgia Iron Works pump rated 10,000 gpm at 250 head.

The new dredge is the first of two identical 96 foot dredges ordered from Dade Drydock Co. in Miami, by the Seward Dredging Company. Conspicuous features are the forward boom tipped by a special rock cutter, having case hardened steel teeth, which is needed for the rock formation under the Southeastern part of the Florida peninsula. The dredge hull is 96 feet long, 30 feet wide and draws 7 feet of water. It is of the knocked down inside bolted panel design and can be disassembled for transportation on railway flat cars. Each of the three diesels is installed in a separate section.

Built with an "A" frame and spud gantry of heavy wide flange beams, the ladder is built in three sections with a total length of 55 feet. The swing gear is a 5 drum in line type built by Georgia Iron Works, with a 60,000 pound line pull. The swing gear brake and clutch control are activated by a Westinghouse Air Control System with the controls located in the lever room.

The swing gear is driven by a 75 hp General Electric motor through a dynamic adjustable speed coupling and a reduction gear.

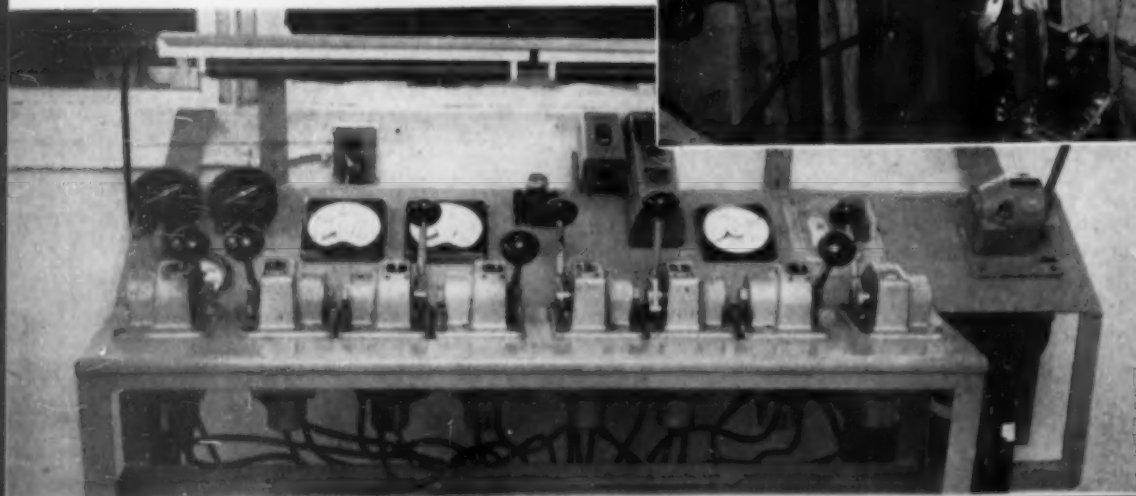
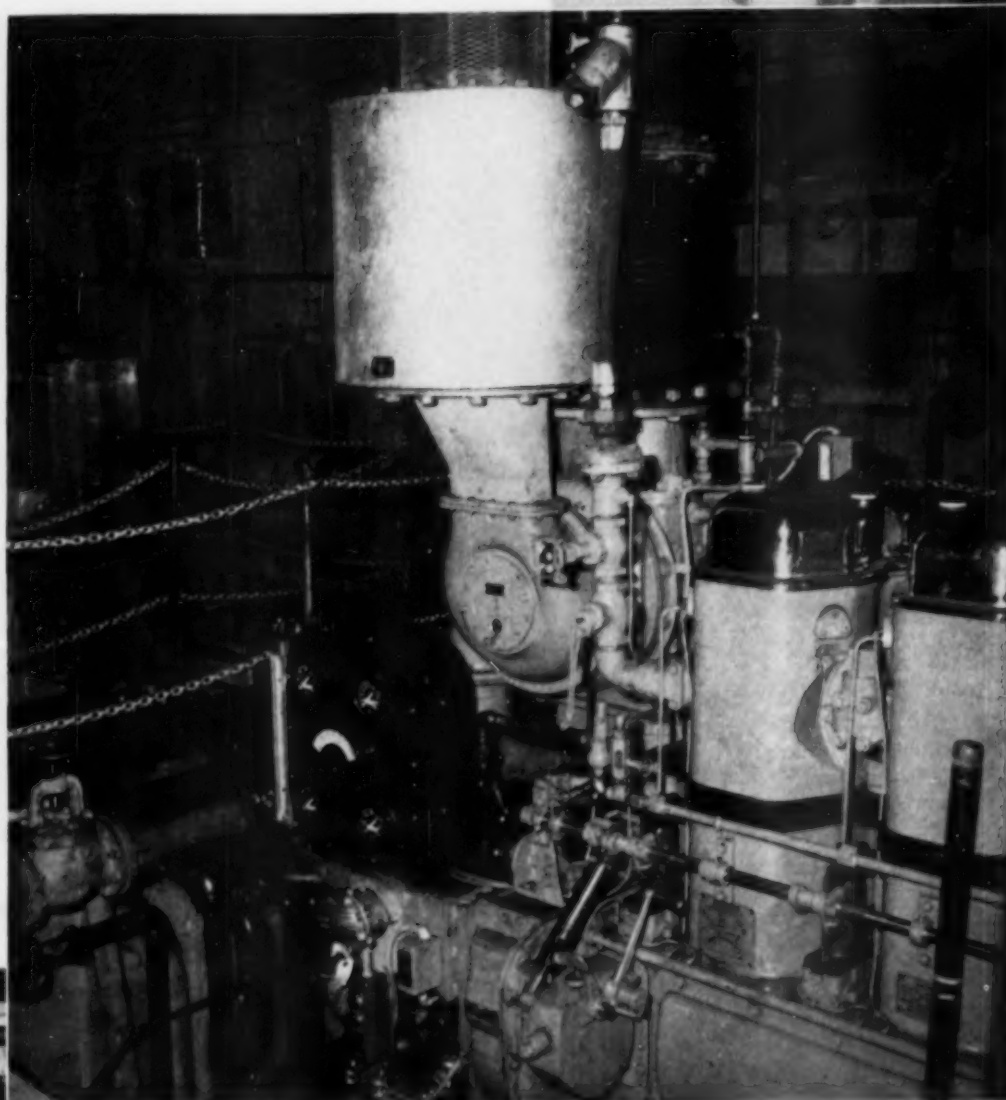
The two spuds mounted aft, are horizontal steel cylinders 60 feet long with a diameter of 28 inches. When the dredge is working one of the spuds is lowered to the sea bottom to act as a pivot on which the dredge swings back and forth drilling and sucking up sand and rock from the bay bot-

The control station on the 1040 hp Enterprise diesel. Note the Kittel intake filter, Alnor pyrometer, Flexonics metal hose, and Brown Boveri turbo-charger.

tom. A Georgia Iron Works 16 inch special design heavy duty rock and sand pump is mounted on a sub base. Rated 10,000 gpm with a 250 head, it can pump 15,000 cubic yards of rock and sand in a 24 hour period. The suction to the pump is 18-in. diameter from the head of the ladder to the sand pump.

Power for the pump is furnished by a 6 cyl. 12 x 15 Enterprise diesel engine which develops 1040 hp at 600 rpm with a Brown Boveri turbocharger and is mounted on a structural steel foundation built as an integral part of the hull. The compact design of this new hydraulic dredge is purely functional and there is not a bit of waste space in the engine room. The main source of electrical power for the cutter motor, swing motor and all auxiliaries is a 6 cylinder Enterprise diesel engine which develops 575 hp at 600 rpm and drives a 450 kw Westinghouse 480 volt, 602 amp generator.

For auxiliary use a model 3-268-A General Motors



The swing gear brake and clutch controls are activated by this Westinghouse Air control system located in the lever room.



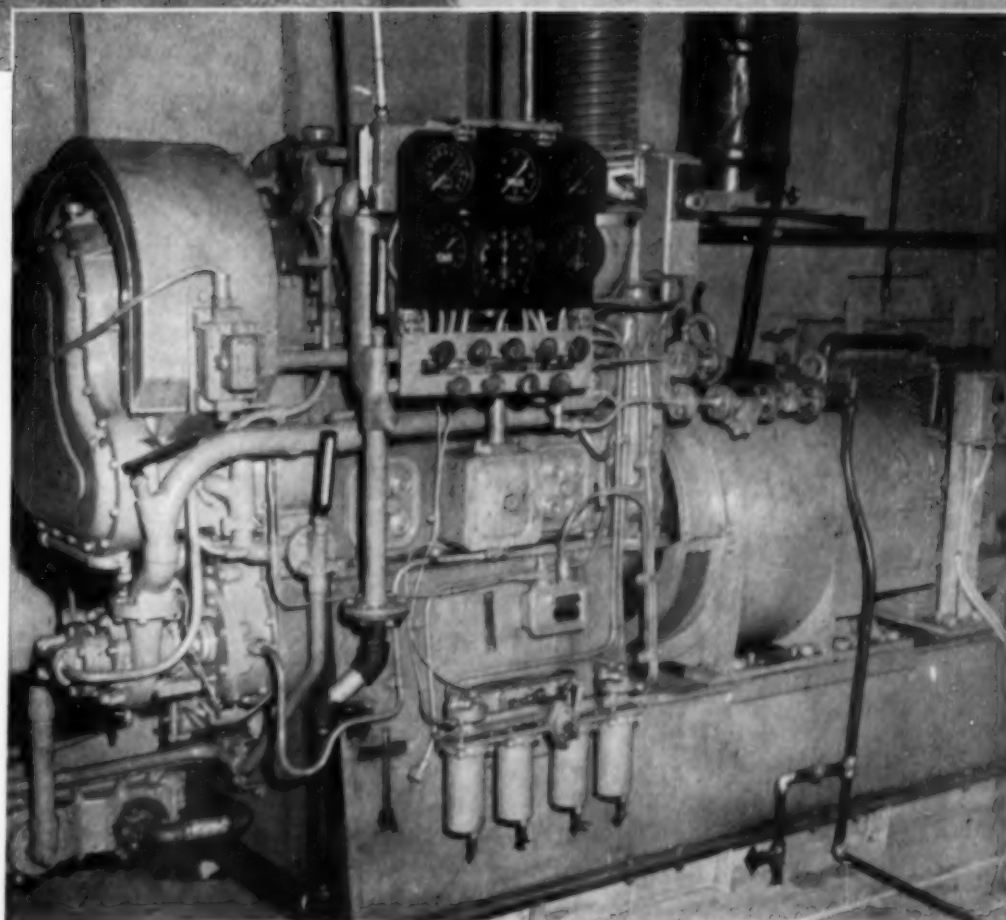
Rear and side view of the Enterprise-powered dredge which is skippered by Capt. J. D. Kitting. Ray Miller is chief engineer.

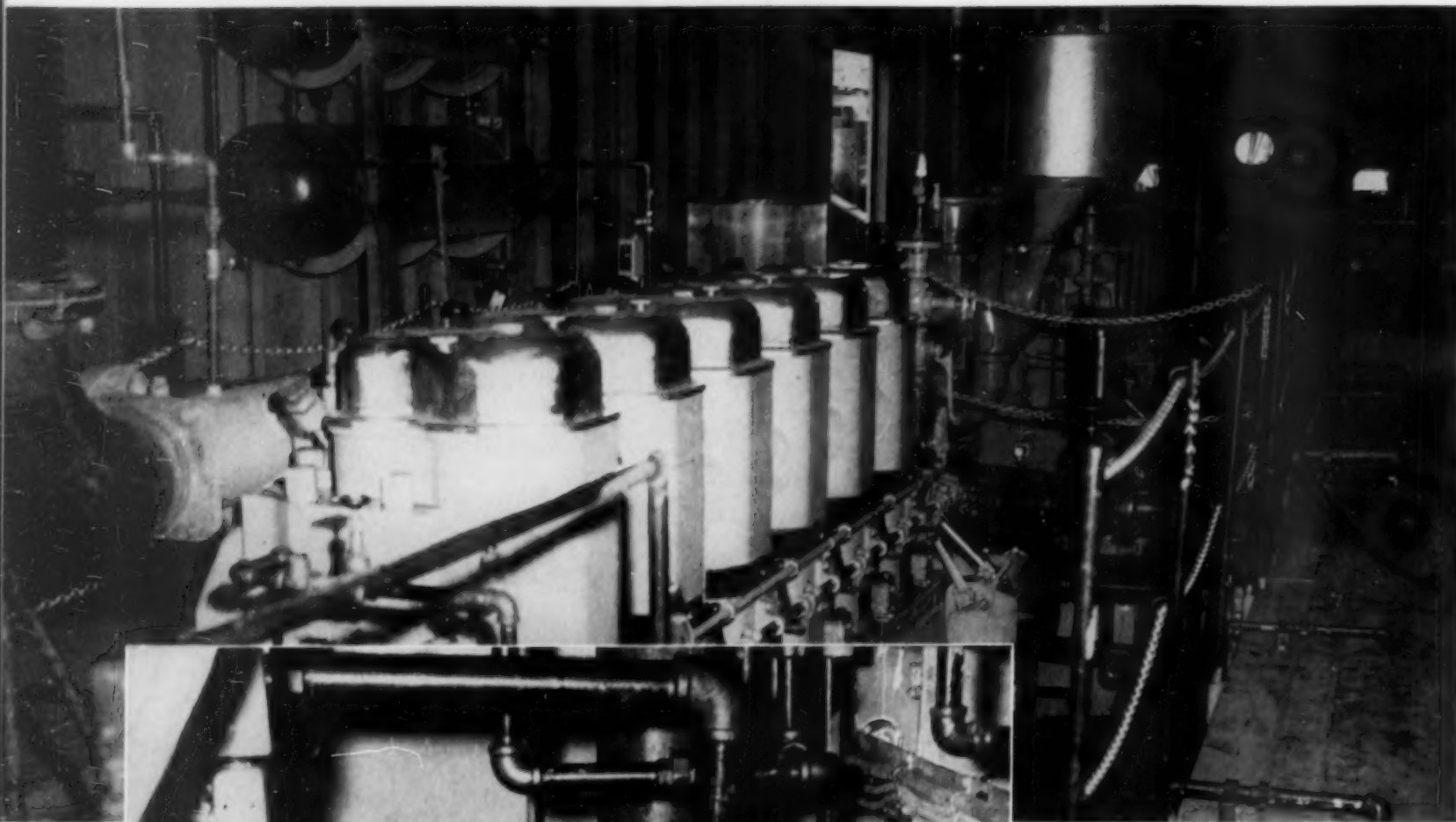
The model 3-268 General Motors diesel with 125 kva Westinghouse generator, used for auxiliary power. It has a Marquette governor. Note the Mercoid switch and Harrison heat exchanger.

diesel engine with a 125 kva Westinghouse 440 volt, 160 amp generator is used. This can be synchronized with the main source of power if necessary. This diesel unit is radiator cooled and has a 32 volt starting system. Tampa Armature Works of Tampa Florida, constructed the special switchboard and control panel.

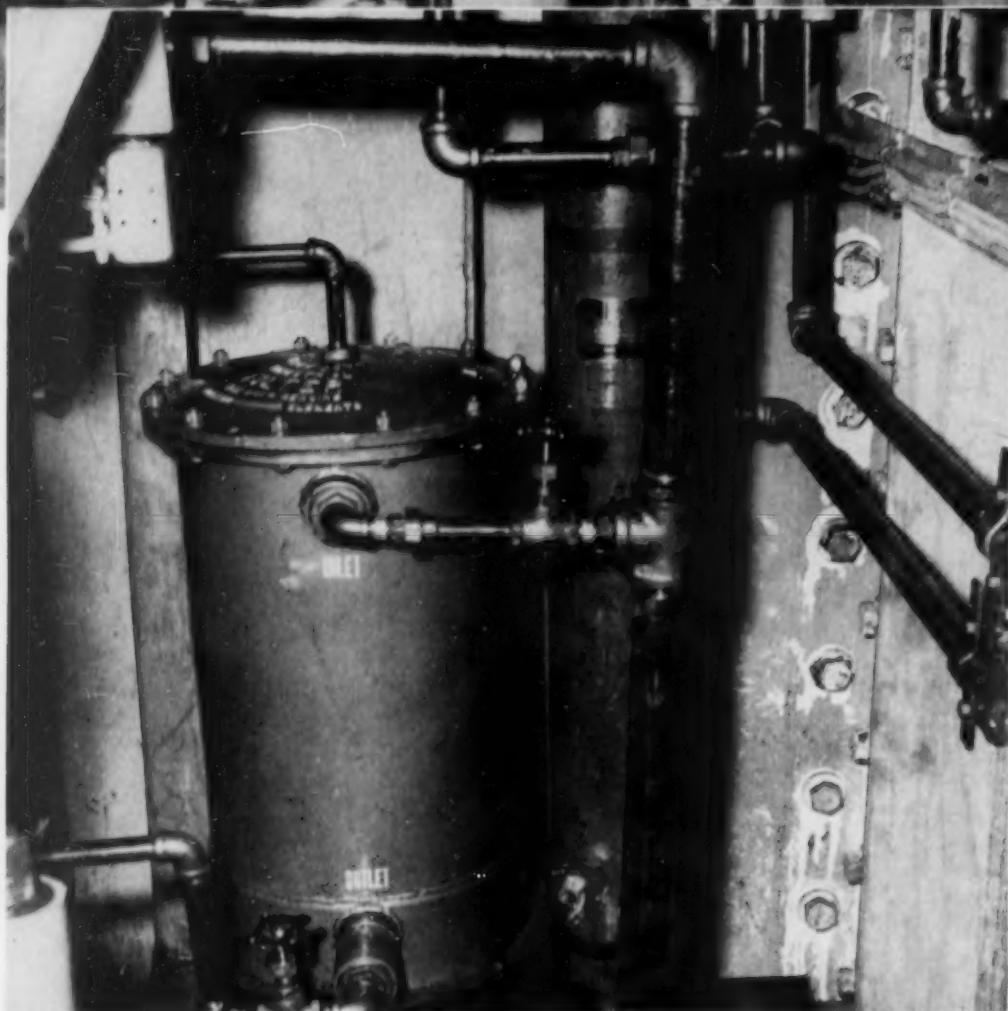
Both Enterprise diesel engines are air starting, the air being supplied by two Saracco air starting tanks. The air for these tanks is compressed by a model 325 Quincy air compressor, driven by a 5 hp Louis Allis electric motor or a Wisconsin gasoline engine. The fuel oil tanks have a 100 ton capacity and in addition 20 tons of lubricating oil are carried.

Ray Pearlson, N. A.; M. E. chief engineer of Dade Drydock Co. said another dredge of similar design





▲ The model DSG-6 Enterprise which drives a 500 kva Westinghouse generator. It has a Woodward governor, Ross lube oil cooler and Winslow lube oil filter.

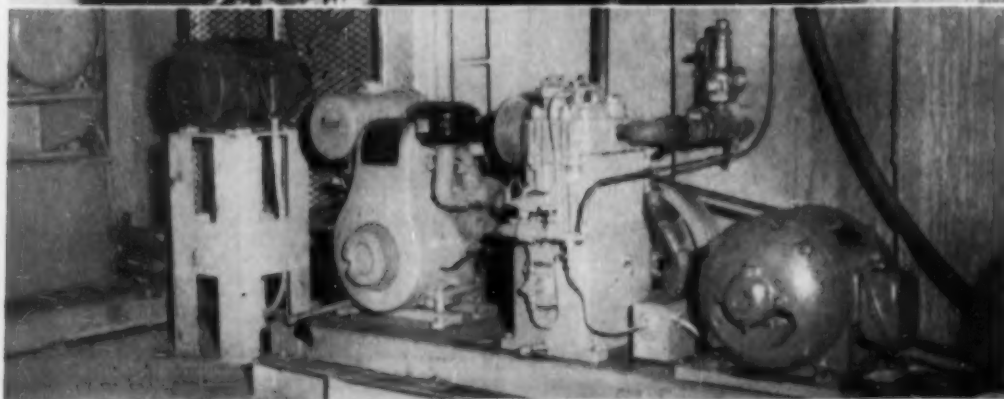


◆ The Winslow industrial lube oil filter model 7-1645-D and Ross lube oil cooler on the engine pictured above.

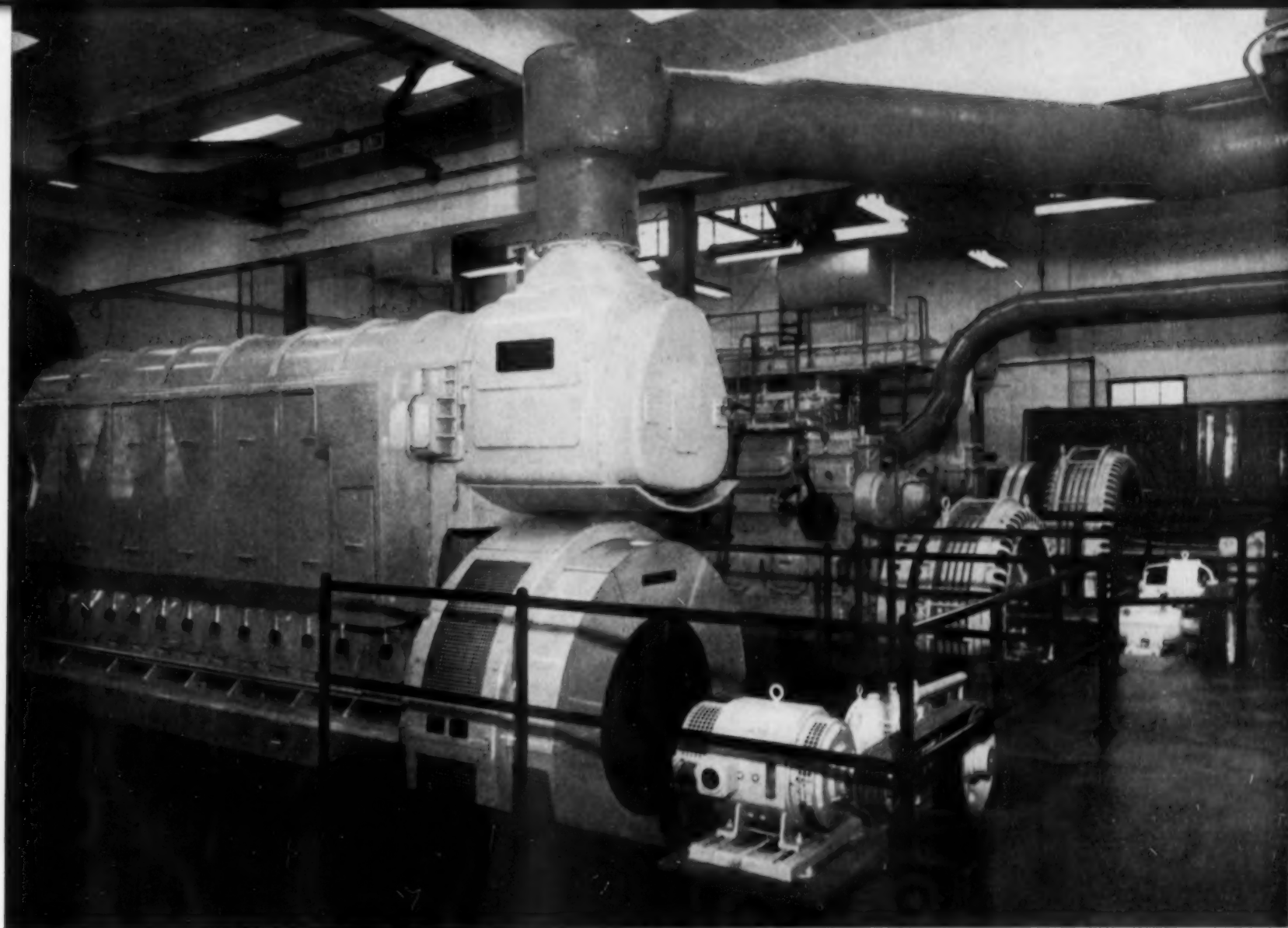
and a 140 foot tanker are under construction and should give Florida shipbuilding a "big lift".

List of Equipment

Main Engine—Enterprise, 6-cyl., 12 x 15, 1040 hp at 600 rpm.
 Turbocharger—Brown Boveri.
 Governor—Woodward.
 Cutter motor power—Enterprise, 6-cyl. 575 hp at 600 rpm.
 Auxiliary engine—General Motors Model. 3-268-A.
 Governor Auxiliary engine—Marquette.
 Air intake filter—Kittell.
 Fuel Oil Filter—Cuno Auto Klean.
 Lube Oil filter—Winslow.
 Air intake filter—Kittell.
 Heat exchangers—Ross.
 Lube oil cooler—Ross.
 Generators—Westinghouse.



◆ The Quincy air compressor unit with Louis Allis electric motor and Wisconsin engine.



Interior of Wells, Minnesota, municipal power plant. Foreground engine is new Fairbanks-Morse 12-cylinder, dual-fuel, OP, rated 1920 hp at 720 rpm. Engine in center is F-M 600 hp Model 33D12 unit, operating on straight oil. Rear engine is an F-M 1400 hp 7-cyl., 16 x 20 Model 33F16 unit, converted to gas in 1952. Air for the new engine passes through an Air-Maze in-line silencer. An Industrial 1½-ton crane serves 1920 hp unit. All the alternators are by Fairbanks-Morse.

WELLS, MINNESOTA

By DOUGLAS SHEARING

WITH earnings at an all time high, the Minnesota village of Wells municipal power plant dressed itself up in 1954 to the tune of \$196,000, which included the purchase of a new Fairbanks-Morse 1920 hp opposed-piston, dual-fuel engine; retired \$50,000 in outstanding bonds, and contributed \$15,000 to the community, which otherwise would have been raised by an additional levy on the taxpayers. All this was accomplished despite a reduction in the rate schedules in 1954. In addition, the municipal utility has retired a balance of \$45,000 in bonds in 1955, leaving the plant completely free of debt.

Earnings have been strongly on the upswing since 1950 when the plant began converting from straight oil to dual-fuel operation. Having supplied electricity for Wells and surrounding agricultural areas since 1895, the plant switched from steam to oil engines in 1931, installing three F-M

Model 32 Style VA diesels totaling 660 hp and adding a 600 hp. Model 33D12 unit four years later. A fifth was installed right after the war, this time a 7-cylinder, 16 x 20, Model 33F16 engine, rated 1400 hp at 300 rpm. Its sixth, a 10-cylinder Model 38DD-8-1½ opposed-piston engine of 1600 hp went into service in December, 1950, and was converted from diesel to dual-fuel operation in September of the following year. This unit, one of the first Fairbanks-Morse opposed-piston engines to operate on dual fuel, operated so economically that the plant converted its Model 33F16, 1400 hp engine to dual-fuel in the month of September, 1952.

At the end of 1955, Wells was producing 7,067,484 kwh, an increase of 14.1% over the previous year, and showed a net income of \$82,758.81, 15.1% higher than the previous year and the highest earnings in its history. The utility states that this record was

directly attributable to the increased use of low cost gas fuel. The plant's excellent earnings since it first began switching from straight oil operation to dual-fuel made plant expansion in 1954 a simple matter to finance. First on the schedule of expansion was the building of a one-story, red-brick building between the plant and the distribution department warehouse, tying them together and providing new offices and a garage for the electric utility.

The three Model 32 Style VA straight oil diesels that had been in service since 1931 were dismantled and removed, and the new Fairbanks-Morse 1920 hp. opposed-piston, dual-fuel unit installed. A partial basement was constructed for the engine's accessory equipment. Lastly, the engine room's walls and ceiling were covered with acoustical tiles to make the engine room quieter and brighter. Two of the three Model 32 engines that



Facade of the Wells, Minnesota, municipal power plant with a new central portion, containing plant offices and garage, unified plant structure.

were removed from the plant after 23 years of operation were sold for further service in Wisconsin and Iowa. The new engine, which brought the plant's total horsepower up to 5520, proceeded to make significant reductions in plant fuel costs almost immediately. Although no figures were available for gas consumption of individual units in 1954, the plant's totals for all engines reveals the contribution of the new engine.

In 1953, the plant produced 7,670,000 kw hrs. while consuming 93,181,000 cu. ft. of gas and 133,711 gal. of oil. This represented an average of 12.14 cu. ft. of gas and .0174 gal. of oil per kw hr. at an average cost of 5.2 mills. In the last 8 months of 1954, with the new dual-fuel engine in service, the plant generated 5,489,300 kw hrs. on 61,582,200 cu. ft. of gas and 76,860 gal. of oil for an average of 10.1 cu. ft. of gas and .0104 gal. of oil per kw hr. The plant's average fuel cost was cut to 4.5 mills per kw hr. In a month of maximum production by the new unit, the plant has operated on 9 cu. ft. per kw hr. and .012 gallons of oil per kw hr. at an average fuel cost of 3.72 mills per kw hr. Based on this showing, the utility looks forward to more operating economy than ever before in the coming years. It should be em-

phasized that all figures cited for 1953 and 1954 include some straight oil operation.

Putting the new unit's accessory equipment in the partial basement allowed for more working space on the floor level. There is a centrifugal jacket water pump on the new engine and also a motor-driven centrifugal pump with a separate line to carry jacket water to the coils in the forced-draft cooling tower which serves the entire plant. To control temperatures, there are automatic thermostatic valves bypassing raw water around the tower nozzles and automatic controls for the tower shutters. The fans are manually controlled. For each of the OPs, there is a thermostatic valve which bypasses jacket water around the tower to maintain prescribed temperatures. Another economy was achieved by circulating the jacket water through pipes in the floor of the new offices and garage for radiant heating.

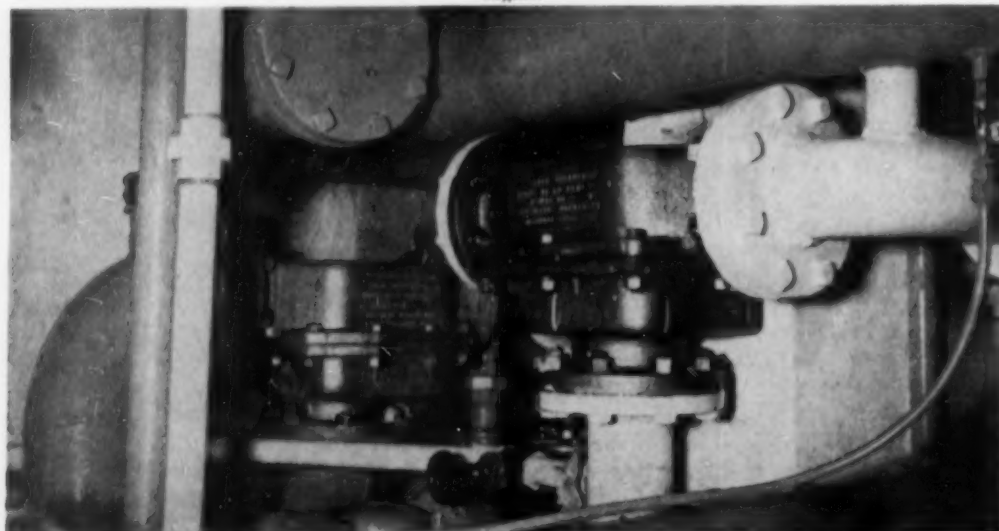
Lube oil is circulated in the new unit by an engine-driven pump and the circuit includes a full-flow strainer and a lube cooler. Some of the oil is bypassed from the engine pressure system through a cellulose pack purifier. Lubricating oil consumption has been low. In ten months of

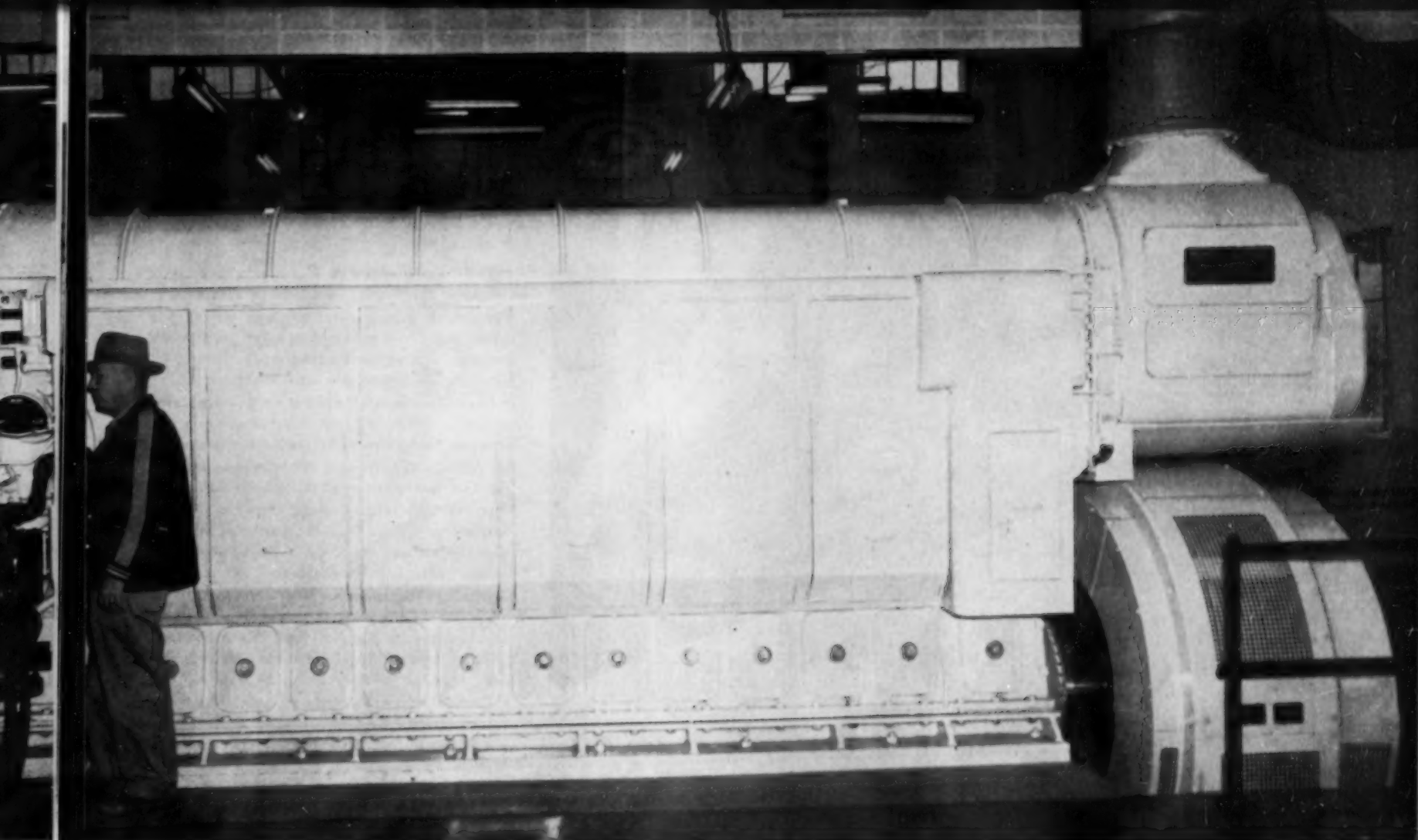
operation, the new engine averaged 5359 rated horsepower hours per gallon of lube. The engines, of course, run cleaner on gas but the lube oil remains in prime condition regardless of the type of fuel used. At 23,000 hours, a check of the Model 38DD-1/8 OP, installed in 1950 and switched to dual-fuel in the following year, showed no discernible wear on the aluminum bearings. They looked like new.

Natural gas is fed to the plant's three dual-fuel engines through separate iron case meters with a base volume index and direct reading on back. It enters the meters at 47 psig and passes through regulators to enter the Model 33 dual-fuel engine at 25 lbs. and at 33 lbs. to the two OPs. Fuel oil is api gravity 37.6 with a heating value of 138,064 Btu/gal. There's a 600 gallon day tank in the basement for the new unit. The unit switches automatically to oil if gas pressure fails and gas is cut off automatically if pilot oil or lube pressures fail. A gauge and alarm panel is convenient to the unit on the engine room level.

At the suggestion of Superintendent Barton, the engines and alternators were painted spotlight buff, jacket water pumps, filters and piping blue; the raw water system green; lube oil equipment yellow; gas meters, regulators and pipes red; and the fuel oil system purple. This scheme of identification of equipment according to materials handled proved to be a time-and-money-saver. It makes the matter of identifying valves or tracing

Amot automatic thermostatic valves, located in partial basement of Wells plant regulate jacket water and lube oil temperatures for new Fairbanks-Morse 1920 hp dual-fuel, OP engine.





Broadside view of new Fairbanks-Morse 12-cyl., opposed-piston, dual-fuel engine, installed in Wells, Minn., municipal power plant in 1954. Utility Superintendent Howard E. Barton prepares to start engine.

pipes fast and easy, besides adding a lot of cheerful color to the interior of the engine room.

The utility's management was highly satisfied with the overall results of the expansion and improvement program. Maintenance costs were cut from a low .74 per hp in 1953 to an extremely low .29 per hp in 1954. Moreover, dressing up the place promoted spotless maintenance thereafter, and the new look plus the quiet operation of equipment made the plant a better place to work in for all concerned.

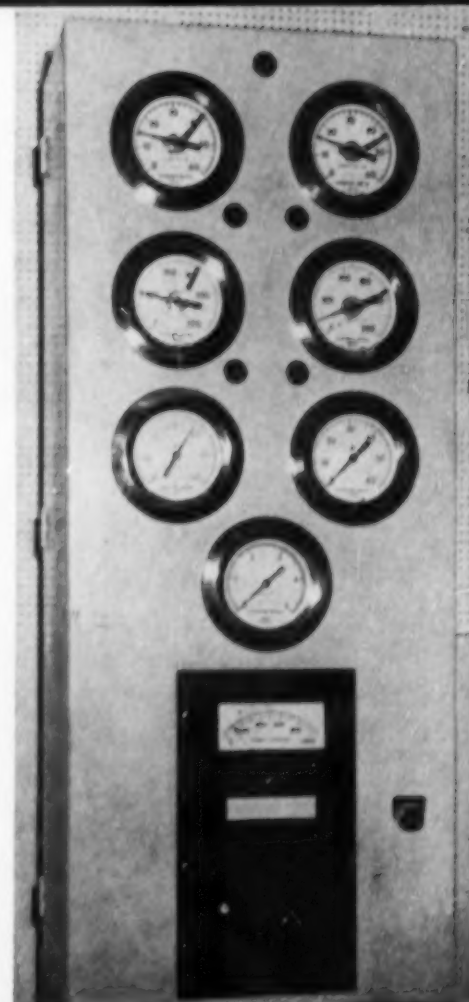
This municipal power plant, which has long been a valuable citizen of the community it serves, has increased its value each year. First, it performs the big job of providing a dependable source of power at moderate rates. Second, it has contributed to the municipality in the last four years a total of \$60,000 which would otherwise have been raised by imposing additional levies on the citizens. Third, it has financed many public improvements: since 1949, it has contributed \$20,000 for a well and pump, \$20,000 for a mercury vapor street lighting system, and \$65,000 to the local hospital. All plant equipment has been paid for out of earnings. In 1954, the plant used reserves to improve itself both as a power producer and as a public building. The community is justifiably proud of its power plant, its attractive

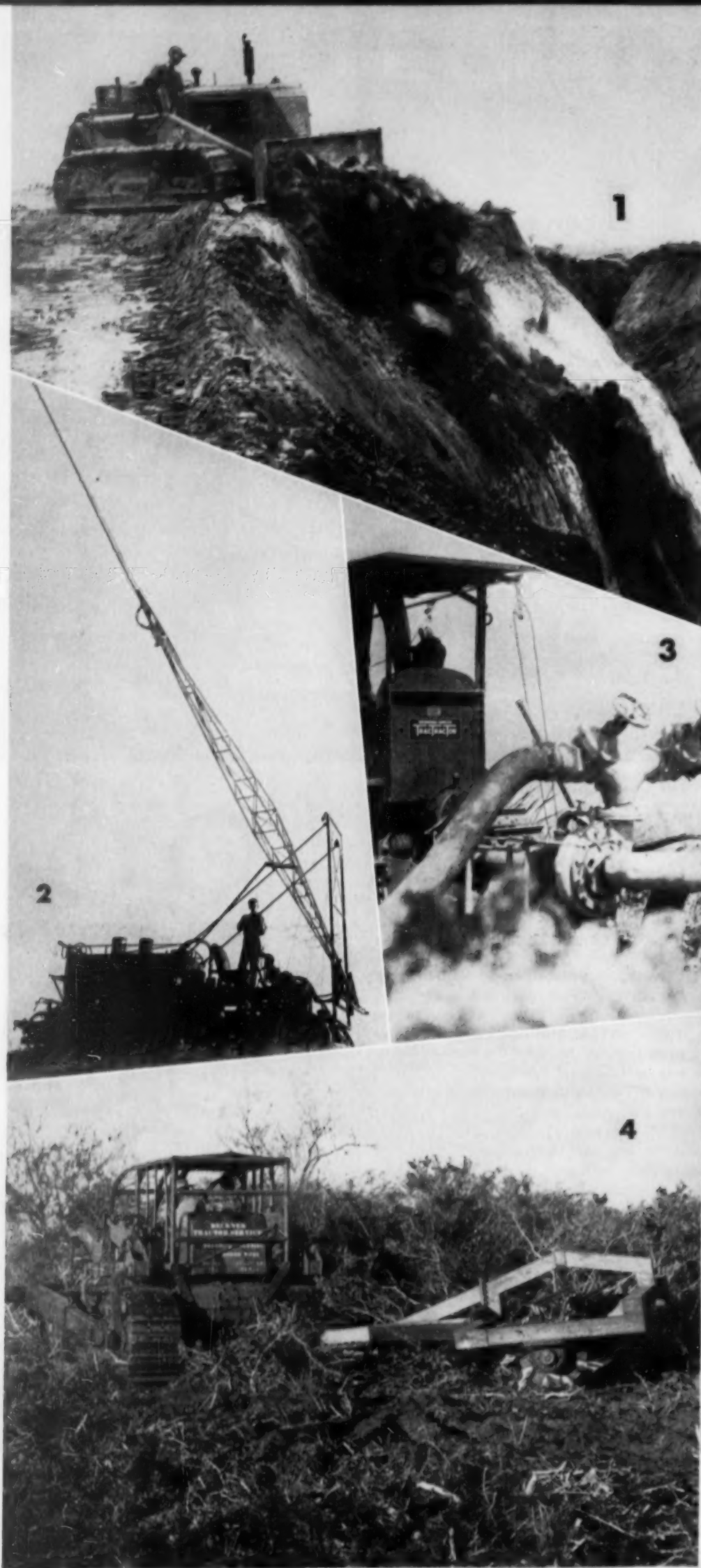
facade, spotlessly maintained interior and record of dependable and economical service.

List of Equipment

Engine—Fairbanks-Morse. Model 38DD8-1/2, 1920 hp., 12-cyl., 720 rpm., dual-fuel engine.
 Alternator—One Type TGZO, 1700 kva., 1360 kw., 3-phase, 60 cycle, 2400 volt, v-belted 15 kw. exciter. Fairbanks Morse.
 Governor—Woodward.
 Gas meters—American Meter.
 Gas pressure regulator—Fisher.
 Fuel filters—Nugent.
 Lube Oil—Standard Oil (Indiana).
 Lube filter—Air-Maze.
 Auxiliary lube pump—Roper.
 Lube oil cooler—Ross Heater Div.
 Lube oil purifier—Briggs.
 Thermostatic Valves—Amot.
 Gauges—Marshalltown.
 Pyrometer—Alnor, Inc.
 Intake air silencer—Air-Maze.
 Crane—Industrial Crane & Hoist Corp.
 Cooling tower—Diesel Service Co.

Gauge and alarm panel with Marshalltown gauges and Alnor pyrometer is convenient to new Fairbanks-Morse 12-cyl., OP, dual-fuel engine on engine room level.





THE dieselized tractor is in greater demand on farm, ranch and plantation in 1956 than at any time in the past. Not only are farms getting bigger and better managed to meet the post-war economic squeeze but the tractor is being used for more and more jobs that were never mechanized before. This is your reporter's conclusions after attending the annual state dealer association convention, University of California Farm Machinery Conference, manufacturer showings of new equipment to dealers of two of the famous old full-line companies, and several special crop "days" at the University of California the past year. But to clear the air and get down to the latest forecasts of what is in store for the farmer this year, read these statements by authorities:

"Farm wages are going still higher," said the Farm Journal to its 3 million-odd readers in its December "Farmcast". "The current business boom is failing to reverse the farm price and downward income trend," said the Oregon State College economists in the college news sheets at the close of 1955. "Times will get worse for most Washington farmers before they get better," said Washing-

A TD14A International tractor bulldozing an ugly seam to restore a field to its most efficient producing state.
(2) A GM powered spray rig designed to do a job on ditches and



DIESELS ON THE INCREASE

By F. HAL HIGGINS

ton State College price specialists on return from the National Outlook Conference at Washington, D.C., in December, 1955. Both State and USDA economists agreed the price squeeze will get tighter, but added, "There will be some money in farming next year and for the years following for those farmers who own or rent good farms and operate them with sufficient setup to keep operating costs low."

The writer found in his Corn Belt home area where he inherited a farm the past year that the trend to shift the marginal farmer from agriculture to industry is on in a strong trend in those areas where insufficient land, capital, labor and equipment makes farming unprofitable. This trend in corn, cotton and grain belts is proved by the statistics on tenant and share crop farming, especially in the South as seen in Census figures from 1950 to 1954. There are 600,000 less farmers for the whole United States, yet the acreage farmed declined little. The good farmers with capital, equipment and managerial ability enlarged their farms by adding the smaller farms left by those who moved into industry.

There isn't a crop among the 200-odd commercial farm crops grown in California that can't be mechanized to replace a large percentage of the hand labor that has traditionally planted, weeded, thinned, sprayed or dusted, pruned, harvested, packed and loaded from big and little ranches. In fact, it has to be done. Farm laborers on the lowly "stoop" jobs are getting scarcer and scarcer and drawing higher and higher wages as they move from such jobs to industry, services and governmental work that puts them on shorter hours with regular instead of seasonal pay checks with the bright lights of cities and towns as attractions. All through the past year the weekly California Farm Labor reports have shown shortages of labor in some or all of the areas covered in the state. As many as 7,000 to 10,000 workers have been wanted without appearing for jobs in coastal or valley areas as the various crops were planted, cultivated, pruned and harvested from Mexico to the Oregon border. Visits to the University of California agricultural college crop days has been a revelation this past year. One studied the crowds of tomato, asparagus, grape, vegetable and other types of farmers who attended the programs

and demonstrations held at their requests. They wanted the latest reports on machines, new varieties developed for new machines that were being developed cooperatively by specialists in agricultural engineering, soils, crops, irrigation, pests, etc. All work as a team to get the answers to the practical growers. Here are a few things coming along that are about ready or show promise to set the styles in the new farm machines:

1. Grape harvest for raisins and probably for wine, at least, via tractor with special hydraulic and air attachments to clip the bunches of grapes from vines and lay them on a strip of paper under the tractor. Now in third year of development with practical application to the industry not far in the future.

2. Olive harvest by tractors is already a success for ripe olives. The UC agricultural engineers under Prof. Lloyd Lamouria have equipped an Oliver Diesel wheel tractor with shaking and catching frame attachments for field trials this winter. International crawler diesels were reported doing a highly successful job at olive harvesting during

roadsides where ordinary sprayers cannot reach. (3) Here an International doubles as pump power for sprinkler irrigation. (4) Heavy diesel crawlers do an excellent job in clearing Texas

brushland for farming. The unit is a TD 14 with bulldozer. (5) An Allis-Chalmers HD with bulldozer and logging arch at work in Western Oregon. (6) The dieselized truck is a standard

feature on many big California ranches for the long haul of marketing crops. This Cummins-powered Peterbilt is working near Clarksburg where sugar-beets, corn and other crops

are raised. (7) This dieselized Cat DW10 dives into the long pit silo and unloads, spreads and packs the load as it rolls through and returns to the field for another load.





This rugged MRS Cummins powered wheel diesel is leveling land for cotton near Five Points. This machine is now being built at Sunnyvale, California, in the Wooldridge plant. It is a 500 hp tractor-scraper.

the past several seasons with California olive groves. The use of such diesel equipment will increase.

3. Tomatoes are being bred for machine harvest and demonstrations at Davis before growers in a day program proves certain varieties of this important crop are ready.

4. Asparagus is getting similar mechanization with changes in both consumer taste and grower planting and cultivation. In other words, asparagus is to be grown on flat ground surface instead of high beds, which means green "grass" instead of bleached white.

The University's agricultural college brings in the inventors, dealers and manufacturers to show farmers new machines that fit into their plans to solve these new crop problems being put up to them in various specialized farming areas of the West. The farm tractor keeps adding new jobs. Each crop mechanized calls for the mechanization of competing crops to keep them in the farming system. Cotton mechanization, for example, is forcing the mechanization of the raisin grapes. The same hand labor that harvested cotton in the

past also harvested the grapes in the San Joaquin Valley where these two leading crops competed for labor, capital and managerial ability. To a lesser degree, all the tree crops of nuts and fruits are being mechanized to compete with both row crops and field crops like wheat, rice, alfalfa and the vegetables grown.

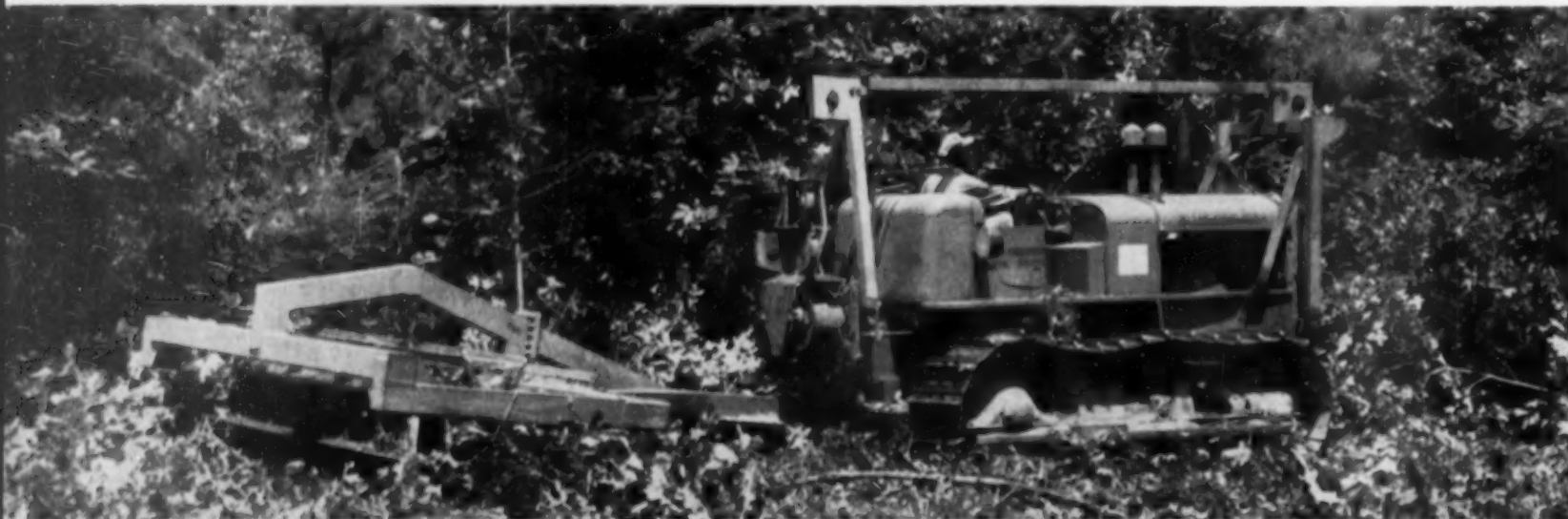
Our world leadership in farm mechanization, recognized by even the Russians as early as 1876 when it sent over a commission to learn how we could beat them on the Liverpool wheat markets, prevails today. The tempo is merely faster today because here on the West Coast the farmer is competing with industry, Government, the Stork and population influx from other areas. He even has to fight to make his good land produce enough to make it profitable to hold it for farming instead of allowing it to go for industry, homes and business serving the suburban areas that are mushrooming to take care of the growing population.

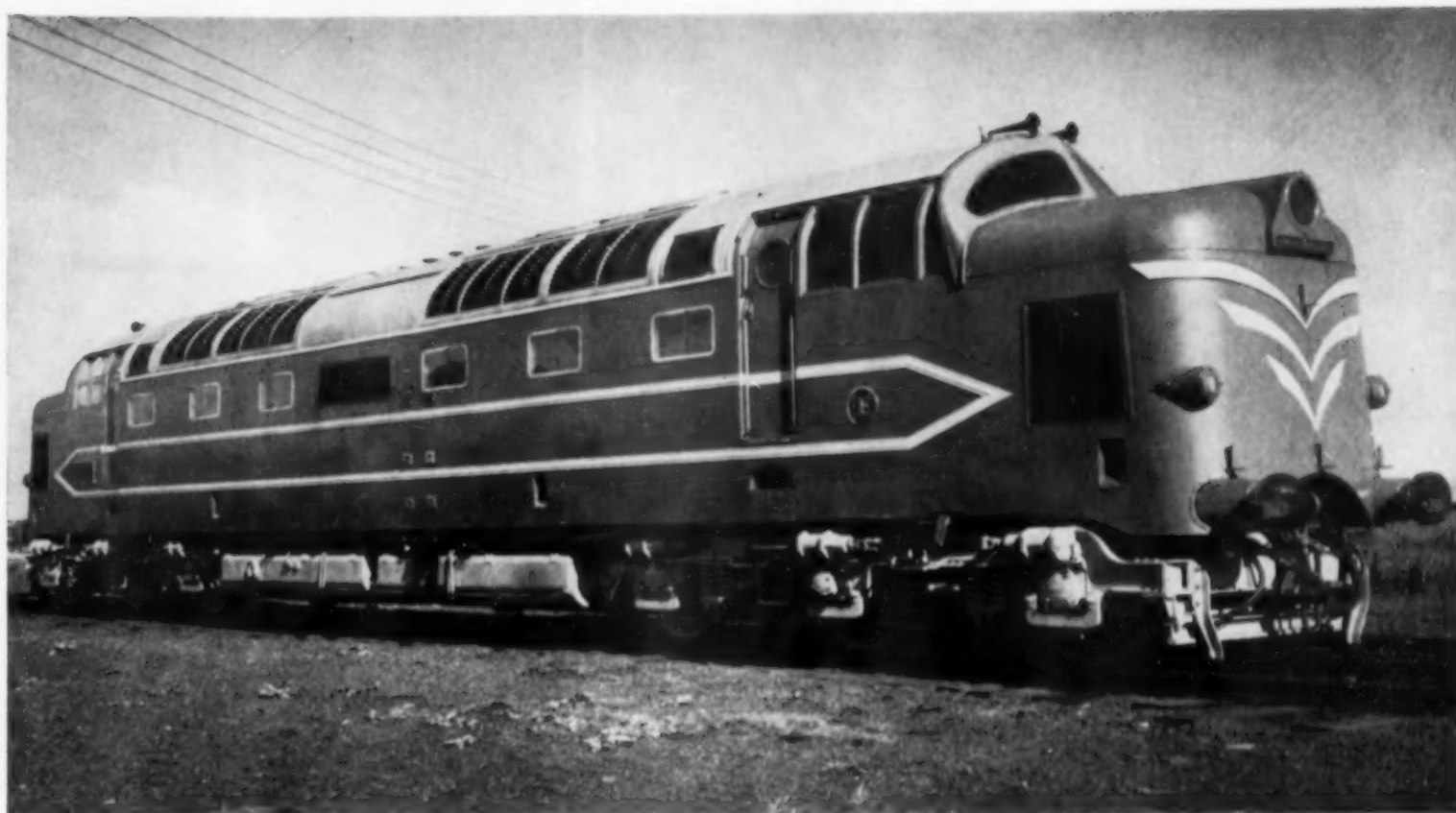
While this trend in California goes way back more than a century to the Gold Rush, it was always in spurts and waves with lots of time between each big influx to absorb the growth. Today, it is like

a tide and it demands more management of agricultural production than ever before.

This seeking of the bigger and smaller diesels for more efficiency is noted throughout the United States. The writer found crawler diesels coming into Iowa for farming with the owners doing bulldozing work in removing hedge fences, stumps, rocks, etc., to make farms more efficient. Thus the farm tractor is getting in more hours work by extending its work season and jobs with the call for diesels to cut operating costs to the bone. The farm press across the nation is also giving both diesels and more farm mechanization attention in editorial space. The full line manufacturers—Allis-Chalmers, Case, Deere, Ford, International Harvester Co., Massey-Harris and Minneapolis-Moline—are all extending their diesel lines toward a complete series. Oliver already has it in five sizes on wheels. Then the arrival of the David Brown line from England is bringing the sizes down to the smallest. A recent announcement has this manufacturer ready to bring in its small diesel for United States powering of garden tractors and other machines. All signs point to 1956 as the greatest diesel farm year to date.

An Allis-Chalmers HD14 at work clearing heavy brush, converting wasteland to productive farmland in the South.





The English Electric Deltic Locomotive, powered by the Napier Deltic engine. Two of these 18-cyl. diesels develop 3,300 hp.

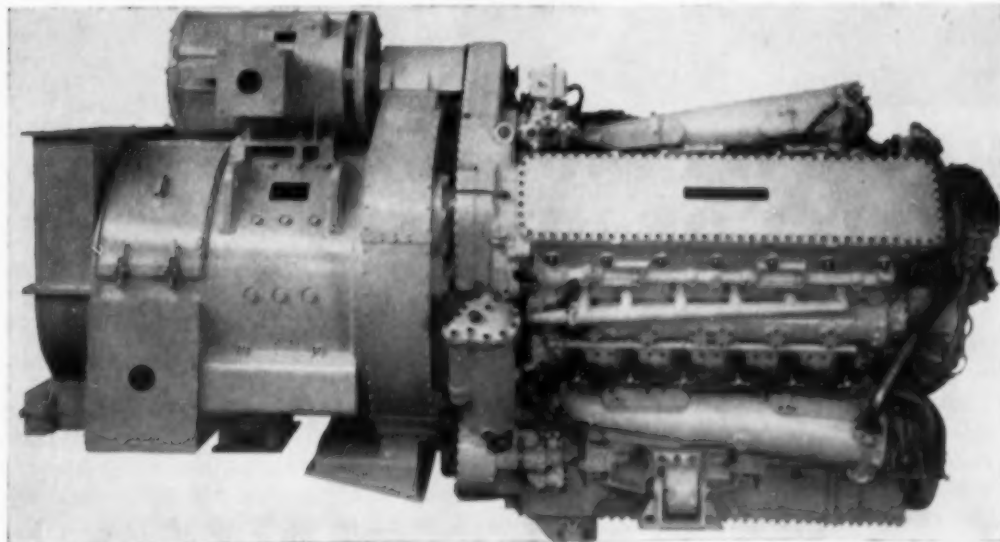
THE ENGLISH ELECTRIC DELTIC LOCOMOTIVE

ASSERTED to be the most powerful single unit diesel-electric locomotive in the world, English Electric Deltic locomotive, made at the Company's Preston Works, in England, is now undergoing trials in Northwest England.

The Deltic locomotive weighs 106 tons, and is intended for main-line passenger and freight duty. It has been designed for a maximum speed of 90 miles an hour in service, but can be geared for higher speeds. It has a long central compartment

with a driving cab at each end, and is of striking appearance. The most significant feature of this new locomotive is the great increase in power which has been achieved in proportion to the weight. The two Napier Deltic engines together develop 3,300 horse power. Thus, with 3,300 horse power and a weight of 106 tons, the ratio is 72 lbs. of locomotive weight for every horse power. This is claimed to be the best power to weight ratio of any form of diesel railway locomotive operating in the world.

The Napier 18-cyl. Deltic diesel. Two of these unusual diesels power the new English Electric locomotive.



The locomotive has a maximum tractive effort of 60,000 pounds and a continuous tractive effort of 31,000 at 33 mph. Overall height from the rails is 12 ft. 10 1/2 in. and the overall width is 8 ft. 9 1/2 in. The length over the buffer beams is 64 ft.

The two 18 cylinder Deltic engines are designed and manufactured by D. Napier & Sons Limited, a member of the English Electric Group, who have pioneered many internal combustion engines. The Deltic engine is an extremely versatile design and has already proved itself in motor torpedo boats and other applications. It is named Deltic by reason of the unusual arrangement of the eighteen cylinders in the unusual form of an inverted equilateral triangle.



WORLD'S FIRST TRANSCONTINENTAL RAILROAD GOES DIESEL

By CHARLES F. A. MANN

TO another generation the building of the Canadian Pacific Railway System by private capital, as the world's first transcontinental railway, was possibly the greatest construction epic of the 19th Century. As part of the agreement following

confederation in 1871, the dominion government agreed, that if British Columbia would join to form a strong central Canadian federation, it would connect this vast, lonely province in the far west of Canada, to the settled eastern Canadian

region with a transcontinental railroad. The early attempts to build a railroad by government order were definitely a flop, and it wasn't long after an election that a group of notable Canadians were called together to do the job with private enter-



A General Motors locomotive pulling a Canadian Pacific freight train over Stony Brook Bridge in B.C., Canada.

Part I

prise. The young Canadian government had little cash but millions of empty western acres and a mighty hope that the Atlantic and the Pacific would be spanned by the iron horse. The Canadian would own this, the strongest link in the expanding

British empire, then being put together by Queen Victoria and her mighty prime ministers.

So, Donald Smith, later Lord Strathcona, and his group were given 25,000,000 acres of land and \$25,000,000 in cash and the blessings of the Ottawa government. Also ten years to do the job. What followed has inspired the world. The job was completed in a little more than five years, and the "Last Spike" driven at Craigellachie, B. C., a gentle spot where today's diesel freight trains pass each other on an 85 car sidetrack and a section boss carefully clips the grass around a stone cairn marking where the line from Vancouver met the line from Montreal, November 7, 1885, four years before the Northern Pacific, rushing westward in the U.S.A. reached Puget Sound.

The history of motive power on the CPR has been a long one, mostly of steam, largely built in its own shops, and fired with coal from the Maritimes, Alberta and even by rail and lake steamer from Pittsburgh to the head of Lake Superior where the tracks touch the great inland sea. Because of the economics of bunker C fuel oil, with relation to world marketing, oil fired steam ran the main lines in the far west for years, until new-found Alberta oil displaced Alberta coal in the central regions.

Many have wondered why the CPR clung to steam so long. Many peculiarities of this vast system made it the world's biggest steam-minded railroad long after diesel began its march to the forefront. To begin with the CPR is more than a railroad. It is a mighty steamship operator and a huge hotel operator. And its railroad runs through a country with long cold winters where heating is a paramount problem. Its fleet of steamships have traditionally been built in Scotland. And the Scotch hated diesel. But labor factors; the fact that much of its coal supply was mined from CPR land grant lands and the marine branch kept it a huge buyer of the world's cheapest bunker C fuel oil supply.

So all these kept its steam costs at a lower level, for a much longer period, than U.S. railroads. Also, in the age of speedup of land transportation, Canada is still a vast semi-wilderness, with great distances between few large centers of population, and much of its whole west is still not connected by year round highway networks. So the CPR tailored its job to the economy of the country it served and saved its old fleet of some 1800 steamers far longer than any other railroad did. And no industry could pour so many needed dollars into small communities than a railroad keeping its fleet of steam locomotives built, repaired, fueled and maintained along the 3500 mile span of transcontinental route.

For years industrial Canada to hundreds of smaller cities has been the Canadian Pacific, its largest employer; its biggest hotel keeper; its biggest private land owner; its biggest express, steamship and telegraph system operator, and now, in 1956, one of its biggest airline operators!

The Canadian Pacific has long viewed with some alarm the skyrocketing prices of diesel fuel, particularly worse in parts of Canada than in the

U.S.A. Yet, ironically, the topography and curvature problems of the whole system, at once to the observer make it one of the world's ideal practical laboratories to experiment with everything else but steam! The far-corner cool fact of its reluctance to go all-out for diesel can be found in its board room in Montreal, where, for years, the British empire type of high-level policy-making was followed in the grand manner of the 19th Century Hudson's Bay annual or stated committee meetings, where the first thought was empire, because vast sums of money for the building of the CPR were raised in London, — and the second thought was Canada. So CPR leaned toward Mother England for ideas.

However, when younger CPR men, born and raised in Canada got near the top, and competitive factors in the awakened Canadian people began creeping in, the old board, with its dominating "Empire Minds" faded to a Canadian Board of practical men who saw a mighty chance to rebuild and revitalize a whole railroad that reached its peak under the Old Order under the late Sir Edward Beatty, and is now speedily ascending a new peak under President Norman R. Crump, Canada's biggest diesel railroad enthusiast. So speedy has the Crump regime gotten on with their job, that it now is certain that the CPR B.C. Coast Steamship service will never again order another steamer. The remaining fleet will be all-diesel before long. In 1954-1955 huge orders of rolling stock were placed in the U.S.A. The three principal types of diesel equipment were ordered from the three Canadian firms affiliated with U.S. designers.

The first five diesels on the CPR were 1,000 hp. Alcos, bought in 1945 for use in city terminals. At that time a system wide survey showed one of the spots so typical of early dieselization on U.S. railroads, namely, a key short stretch of important branch or main line in a territory of great traffic importance, whose track and bridge structure would not permit increasing the size or weight of steam locomotives, but whose motive power was reaching the end of the line and more valuable as scrap iron than pulling trains. Like the Great Northern, with its Great Falls Butte, Montana line, Canadian Pacific's bustling little isolated line, called the Esquimalt & Nanaimo, that runs up the east side of Vancouver Island from Victoria, the capital of B.C., to Courtenay, and over the mountainous backbone of the mighty Island, which is larger than Ireland, to Port Alberni, on the Pacific Ocean

EDITOR'S NOTE: The traditionally conservative CPR System, spanning North America from New Brunswick and Nova Scotia to British Columbia, has always followed a policy of "proving everything" before any radical departure in mechanical or operating practices. Just now this vast 17,000 mile privately owned System, together with 4,700 miles of U.S. subsidiary lines is busily engaged in going all out for diesels and speeding its schedules everywhere. Our Mr. Mann made a 4,400 mile survey trip, some 1600 miles of it riding cabs or diesels, and brings the story up to date in three installments, of which this is Part I.

side, is a money maker and an operating headache. It is a line of sharp curves, many hills and few straight stretches of track. Its steel is good but light weight, and its trestles are not made for 5,000 hp. steamers which could be used for heavy freight on heavy grades.

In the early years of surveying clear across Canada to find where diesel would earn its highest rate of return on the investment, the CPR picked out the E. & N. with its heavy lumber, pulp, supplies and log hauls. It was completely isolated from the main line, and the first completely dieselized segment in 1948. The E. & N. was also long famous for its funny little short wheelbase, oil fired steamers that fuelled up from the same oil supply at Victoria that ran the B.C. Coast Steamship service for the Company. Their squeaky whistles and polished sides were a Vancouver Island institution. Summer tourists flocked to the morning train to Port Alberni as one of the scenic tourist routes of the Canadian West. The loggers and sawmills and pulp mills kept the freight trains full.

But today the fleet of 22 quaint little E. & N. Steamers is gone and now 50% more work is being done with a fleet of 12, 1000 hp. road switchers. The next segment of CPR to go diesel was over 3,000 miles eastward, between Montreal and Wells River, Vt. Here again, the steam power on this important line, a part of the main line to St. John, on the Bay of Fundy, as well as to Boston and Portland, Maine, via the connecting B&M & Maine Central lines. Steam locomotives on this route were old and ready for scrap. Here the first CPR mainline passenger type diesels went into service in 1949 and today a fleet of 23 diesels, some of them in extended runs from Montreal to Smith's Falls, Ontario and Three Rivers, Quebec, do the work of 41 old steamers. So with 12 road switchers in 1948; 23 more in 1949 and 58 in 1950 to completely dieselize everything but passenger trains between

Ft. William and Cartier, Ontario, the CPR was off to a giant program of eliminating steam.

The Ft. William-Cartier section was chosen because contrary to popular conception, the 1,000 mile route around the head of Lake Huron and Lake Superior are not water level grades, but mostly over the snout of the vast Canadian Shield, that fantastic mass of rock that spreads over central eastern Canada like a mighty blanket and ends in the promontories of the shores of the two largest Great Lakes. The Canadian Shield divides Canada like a giant wedge. Its forest clad, lake-filled, wind-swept wildernesses rank among the largest on earth, extending in an unbroken panel down from the Hudson's Bay country and clear east to Labrador. Canada is actually two separate countries divided by the Great Shield. Railroading across its face is a mountain type operation, with many curves, long hills and through some of the worst weather area in North America. Dieselizing the Schreiber Division is a chapter by itself. So it got the first big push of diesel on the CPR. Next Dieselization was on the main transcontinental line between Calgary and Revelstoke, where the Rockies and the Selkirks bar the way with tunnels, curves and endless grades. It took 66 road-switcher units to 100% dieselize this region, also a separate chapter in the story.

In 1953 the toughest part of the whole CPR system, the world famed Kettle Valley Line that crosses eight separate mountain summits in a meandering mountain line that traverses the tortuous route across Southern British Columbia near the U.S. border. Actually, an alternate transcontinental line, feeding off the main route near Hope, B.C., in the Fraser River Canyon and running for nearly 1,000 miles to Lethbridge, Alberta, this comprises the Kootenay and Kettle Valley Divisions. A total of 73 road switcher diesels were put on this route, each with full dynamic braking, to

handle heavy freight and passenger movements. This, too, is a story of diesel all by itself.

In 1954, the biggest order of diesels ever placed were 144 units ordered to completely dieselize transcontinental passenger service; also haul fast freights between Windsor (Detroit) and Montreal and between Montreal-Toronto and Winnipeg. This was the first departure toward complete dieselization of whole regions instead of just preferred passenger and freight runs. And a fleet of Budd diesel rail cars was put in service too!

Because it is a true transcontinental railroad, running from the Atlantic Coast to the Pacific Coast, the Canadian Pacific's geographic spread would indicate that practically every type of diesel locomotive ever designed would find a niche on this far-flung system. Startlingly, the canny engineering Staff of Canadian Pacific did just the opposite and actually pioneered up a new avenue of motive power which is currently being widely copied by almost every U.S.A. railroad!

The Canadian Pacific was the first transcontinental system to practically standardize on a single type of locomotive for every type of freight work and most of its passenger traffic—the 8-wheel road switcher unit with open platforms and in all "A" units a full heating boiler installation. This type, together with the closed-cab "A" and "B" units, generally of identical horsepower and mechanical layout, and used primarily in fast passenger service, comprise 90% of the total diesel units in the whole CPR fleet! The economical, highly accessible road-switcher type, singly or in strings up to four units, do the bulk of the work on the entire system. The great distances across Canada, longer than across the U.S.A. and the powerful effect of the three main geographic regions traversed give rise to a combination of operating problems unique in the whole railroad industry.





Map showing the CPR network eastward through the Province of Ontario to the Atlantic.

Canada's rail economy has been traditionally geared to the inland ocean seaports along the St. Lawrence River, and the Lake Ports. In winter, with both the Great Lakes and St. Lawrence River closed in by ice, the CPR suddenly starts moving the longest of long-hauls in the world, and takes its freight and passengers to the Atlantic seaboard at St. John, New Brunswick, where the transatlantic steamships make their winter port. The double track line from Winnipeg to Port Arthur-Ft. William is the world's busiest wheat shipping line, where the bulk of it is transhipped to the Great Lakes steamers. The main-line from there

to Toronto and Montreal, carries much grain in the winter and manufactured goods throughout the rest of the year.

The line from New Brunswick crosses central Maine, thereby giving the shortest route to all year ice free ports of either Canadian system. Since the CPR was the pioneer line across the country, it had its choice of routes and fertile territory, hence it is a system of long branch lines upon which small, but important freight movements constantly run throughout the whole year. Lastly, with the isolated Dominion and Atlantic Railway, serving Nova Scotia and 3500 miles west, the Esquimalt & Nanaimo Railway serving Vancouver Island, each as separate, detached operating units, and each with similar roadbed problems, it is thus easy to see why a single diesel locomotive unit type would fit the entire CPR picture, except in the case of the more attractive, closed cab units that everyone feels necessary to make a pretty looking, fast diesel passenger train.

With heavy industry in the densely populated Quebec-Ontario area and New Brunswick, reached by the fast "Bridge Route" across Maine, with no pickups permitted; the Canadian Shield crossing from Georgian Bay almost to Winnipeg, with its operating characteristics of our Allegheny Mountain area in the east; the rolling, ever westward-rising prairie region between Winnipeg and the Rockies; and the roughest jumble of mountain ranges in the world in British Columbia, the road switcher unit has become as much a part of Canada and the CPR as their Mounties!

And on the whole Kettle Valley line, home of the vast Consolidated Mining & Smelting Company's mine-smelter-hydropower-chemical empire which generates between 50,000 and 60,000 cars of short and long-haul freight each year, to provide both

traffic for the railroad and fat cash dividends for the CPR which owns 51% of it, no type of diesel has ever been invented that works so well there. The sharp curves, sharp switch turnouts, up to nearly 5% grades on mine-run branchlines, many tunnels and light, but high wooden trestles, and a whole belt of tinder-dry pine forest in the summer that used to burn up with locomotive sparks, make the unique Kettle Valley Line perfect for the standardized 8 wheel, dynamic brake-equipped road-switcher type. Even the location of the roomy operator's cab at one end, yet 10 feet in from the 2nd end, is a perfect design for those 22 degree blind curves, snowslides and rock slides up in Coquihalla Pass, the railroad pass with the world's heaviest snowfall. From 500 to 800 inches of snow falls each winter out there! The engineer and fireman have time to jump when their diesel hits a slide and buries its long slender nose thirty feet deep inside one—a perfect safety record that fits into the famed safety record of this giant railroad. The CPR will stop dead before it will risk lives or goods or the crews of its trains, and has one of the finest safety records in the railroad world.

Nearly 700 diesel units will be at work on the Canadian Pacific by the fall of 1956, 85% of them of a single basic type that can softly shunt cars in crowded yards in Montreal or in tandem push the 12-car Kettle Valley Express up Coquihalla Pass on a rainy night. Canadian Locomotive Co.; Montreal Locomotive Works and General Motors Ltd. now share all the orders. For efficiency, manufacturers' individual makes are grouped into operating regions, to save on parts, servicing and maintenance.

Dieselization of the whole prairie region is the current focal point of repowering the CPR and the key to the finale of the world's biggest privately owned railroad transportation system going completely and solidly diesel.





A typical installation showing the Waukesha cooling-heating units at either end of a low-temperature car. Note the conduit at the end of the car.

ANY REEFER CAR CAN CONVERT TO AN MTC

With 130,000 Ice-Loaded Reefers on the Railroads Here Is An Economical, Effective Method of Converting Them to Mechanically Refrigerated Cars, and Obviously the Same Units Can Be Built into New Reefers.

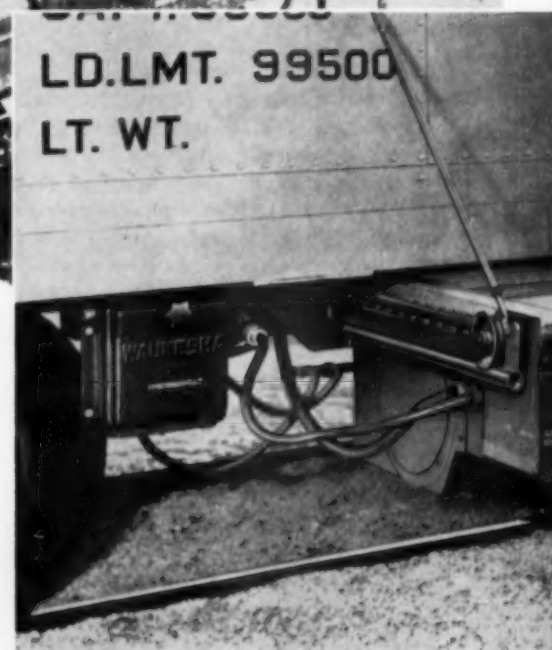
A complete diesel system manufactured by the Waukesha Motor Company, that maintains refrigerator car interior temperatures in the 20 to 70-degree, or the -10 to + 5-degree F range, or supplies heating or ventilating service as required, is in service in refrigerator cars of ten railroad and car companies. This Waukesha Diesel-Icer System may be used for new cars or for converting existing cars to mechanical refrigeration without structural change. When applied to cars originally designed for ice cooling, existing ice bunkers are removed. The system permits loading the entire inside cubic capacity of the car, resulting in a gain of about 10 per cent of usable space in a 50-ft. car.

For low-temperature cars required by the frozen food industry, two completely packaged Waukesha cooling and heating units are installed in the icing hatches, one at each end of the car, and the diesel engine-generator unit is mounted under the car. For cars used in the transportation of non-frozen products at 30 degrees F and higher, only one cooling-heating unit is required.

Installation of the power unit (the Waukesha En-

ginator) requires only attaching two mounting tracks on the car underframe. The Enginator unit is rolled and locked into position on these mounting tracks, which are equipped with extension rails to roll out the unit for servicing and maintenance. A power conduit is installed from the power unit along the underframe of the car, up the end, and along the roof adjacent to the running board. This supplies the electric energy to operate the motor-driven cooling and heating units mounted at the top of the car. To install the cooling-heating units, which are freon-charged at the factory, the hatch cover or plug is removed and the complete unit is installed in the icing hatch frame. The unit fits into standard hatch frames and is equipped with an adapter plate to meet any variation in the frames. The evaporator-air circulating fan section extends into the car. The compressor and condenser section projects above the hatch opening, and working parts are accessible from the car roof.

The diesel fuel system usually consists of two 200-gal. diesel fuel tanks installed on the underframe of the car. A small starting battery box also is lo-



The Waukesha "diesel-icer" Enginator unit rolled out for routine inspection and maintenance. The mounting racks are an integral part of the unit assembly.

cated on the underframe. An automatic temperature control panel is adjacent to the Enginator. Top and bottom inside car temperature indicators are located on the outside wall of the car. The system is also available for new car building programs in either top or side mounted units.

The Enginator is a 6-cylinder, 4-cycle, Waukesha diesel engine, directly connected to a 20-kw, 220-volt, 3-phase, 60-cycle fully enclosed alternator, interior-cooled by engine intake air and exterior-cooled by the radiator motor fan. The diesel engine is water-cooled by a large radiator with a motor driven fan. The engine is rated at 42 hp at 1200 rpm for continuous duty. The crankshaft is

counterbalanced. Valves are Stellite-faced, in Stellite inserts. Cylinders are renewable, wet-sleeve type. Fuel injection consists of a separate injection pump drawn steel injection lines, and pintle-type injectors. Lubrication is by full pressure to all main, rod, and piston pin bearings, and to rocker arms and timing gears. The oil capacity is 22 quarts.

The engine is started by a 24-volt electric system. Sub-zero starting is accomplished with the aid of a 110-volt electric heating element, built into the engine coolant system and operated from standby electric service. Also included is the Chevron capsule-type primer. The Enginator is equipped with protective devices such as automatic shut-down control guarding against engine over-heating and lubrication failure. It is started and stopped manually since it operates continuously when the car is in revenue service. The unit, which is rated 20-kw, weighs 2,100 lbs.

The condensing section of the cooling and heating unit consists of a 3-cylinder, valve-in-head, reciprocating, air and refrigerant-cooled, hermetic type compressor operated by a 6-hp, 220-volt, 3-phase, 60-cycle motor at 1750 rpm. The condenser is a high capacity, finned-tube type, air-cooled by dual



Note the under-car installation of the Waukesha diesel-icer Enginator and fuel tank in this installation. Fuel tanks hold 400 gallons.

integral $\frac{3}{4}$ -hp motor fans. The refrigerant receiver is of fabricated steel and is located within the condensing section of the cooling and heating unit.

The evaporator section of the cooling and heating unit, separated from the condensing section by a heavy insulation barrier, is of the finned-tube, multi-pass, counter-flow type, employing a $\frac{3}{4}$ -hp integral motor fan. The electric heater, between the evaporator and the motor-driven fan, is of 4-kw capacity and thermostatically controlled. Defrosting is accomplished by fully automatic, electrically controlled hot gas.

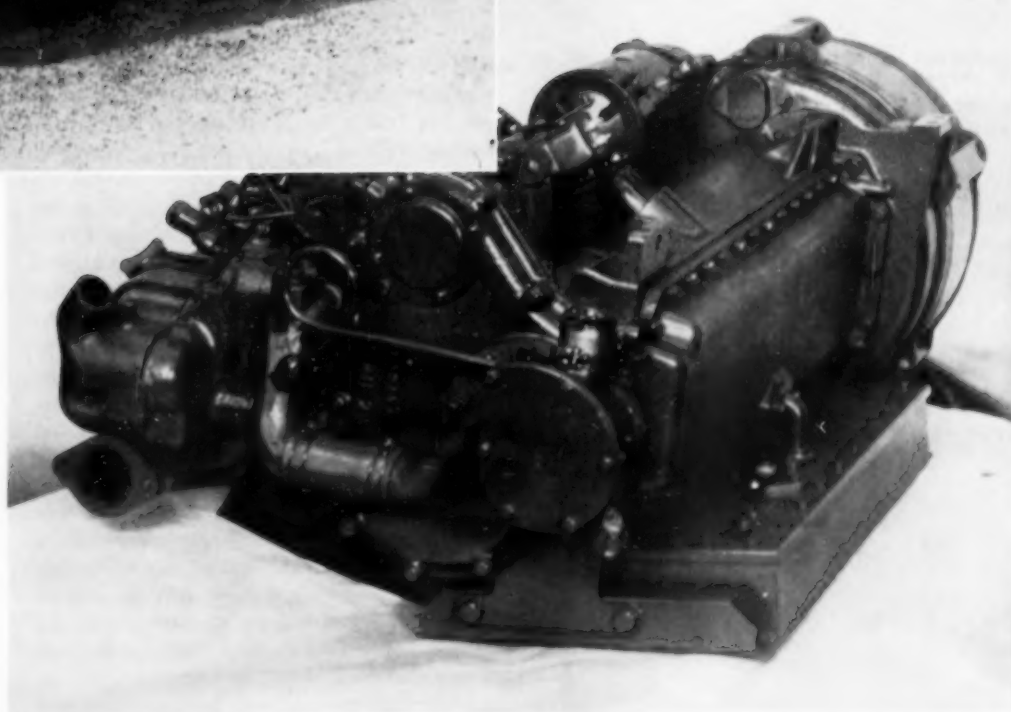
The cooling-heating unit chassis is fabricated of high-strength alloy steel. The evaporator section is galvanized-dipped. The capacity at 90 degrees F ambient, with a car inside temperature of 0 degrees F, is 18,000 Btu per hour. Two units being used in low temperature cars provide a capacity of 36,000 Btu per hour. The total weight of the cool-

ing and heating unit is 1,150 lbs. Controls are electric and fully automatic. This equipment is housed in an accessible weatherproof control box placed on a side panel of the condensing unit. All motors and electric car heaters are overload protected.

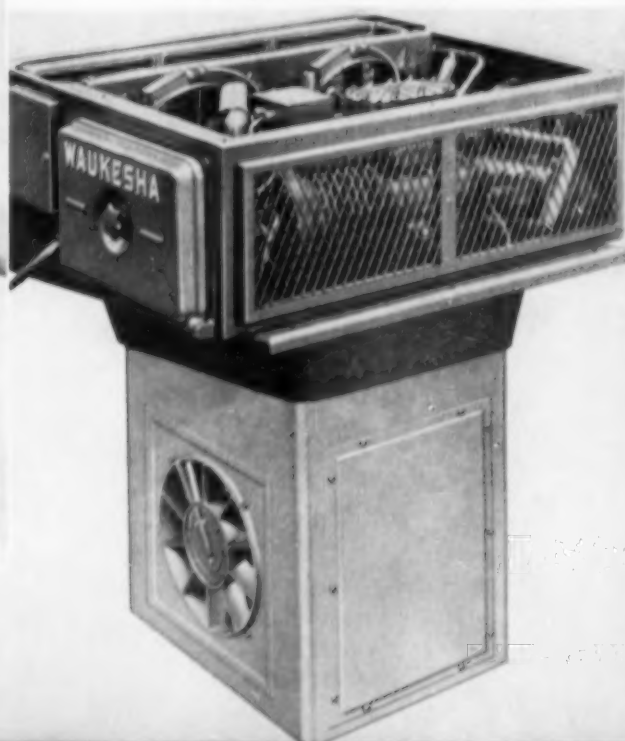
The thermostat of the system is electronic. It is housed in a readily accessible control box conveniently located beneath the car adjacent to the Enginator. It is equipped with a temperature dial divided into two ranges: an upper range from 20 deg. to 70 deg. F and a lower range from -10 deg. to +5 deg. F. The cooling and heating units operate automatically and cycle on and off on demand. Cooling and heating is automatic in the upper range for 20 deg. to 70 deg. F. The control system provides for cooling only in the lower range from -10 deg. to +5 deg. F. The system was designed to meet the operating conditions encountered in freight service and is not affected by changes in altitude and temperatures.

All installations are equipped with an electrical receptacle to permit operation of the electrical condensing units from standby electric power when desired.

Close-up view of the complete Waukesha horizontal diesel engine and alternator assembly.



The cooling-heating unit with the top cover removed to show the motor-driven compressor. The unit is set on one of the ice hatches and releases valuable space for cargo handling.



DIESEL TUG "BARNEY TURECAMO"

The Turecamo Towing Co.

Adds Another Powerful

Tug To Its Fleet

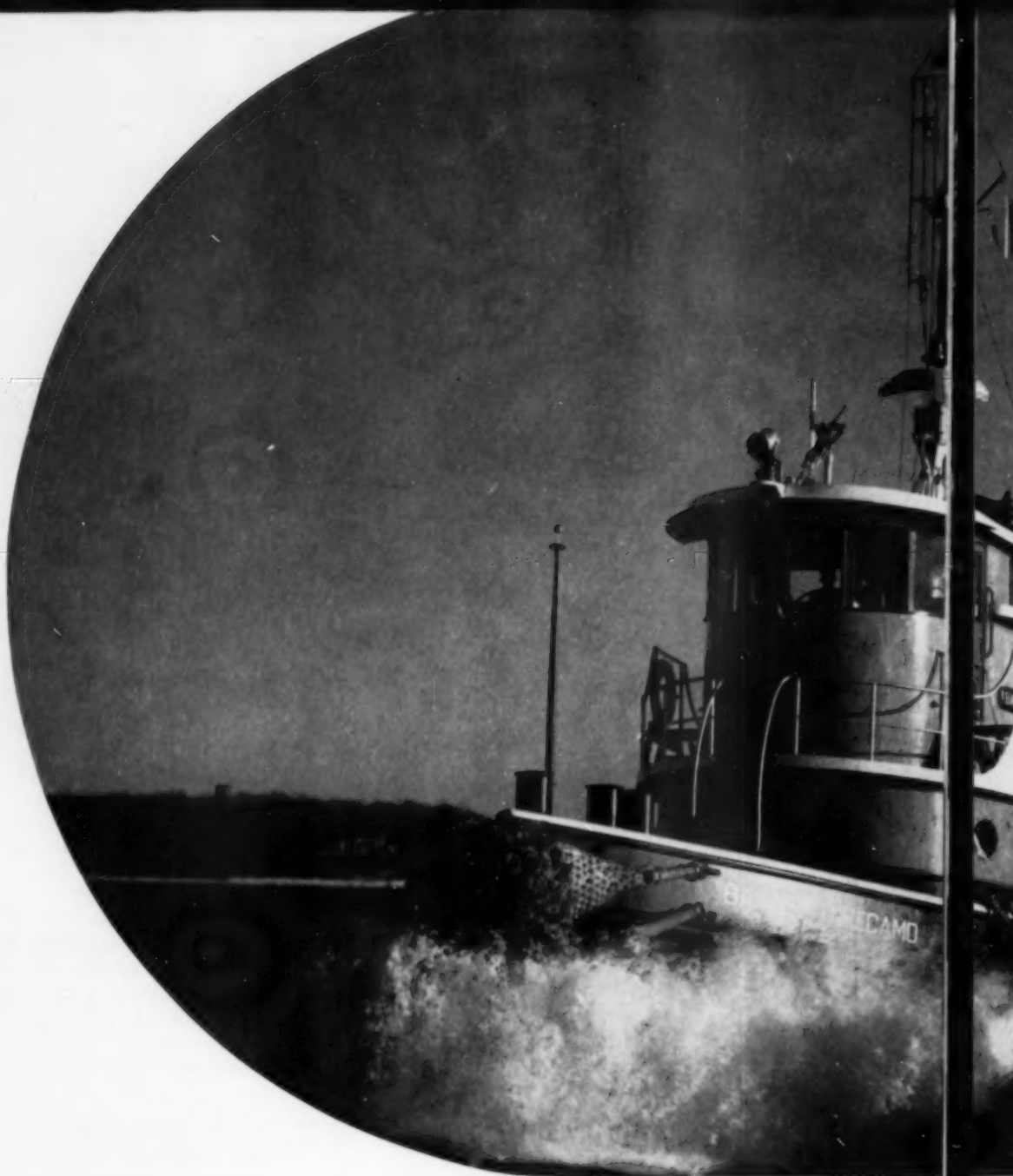
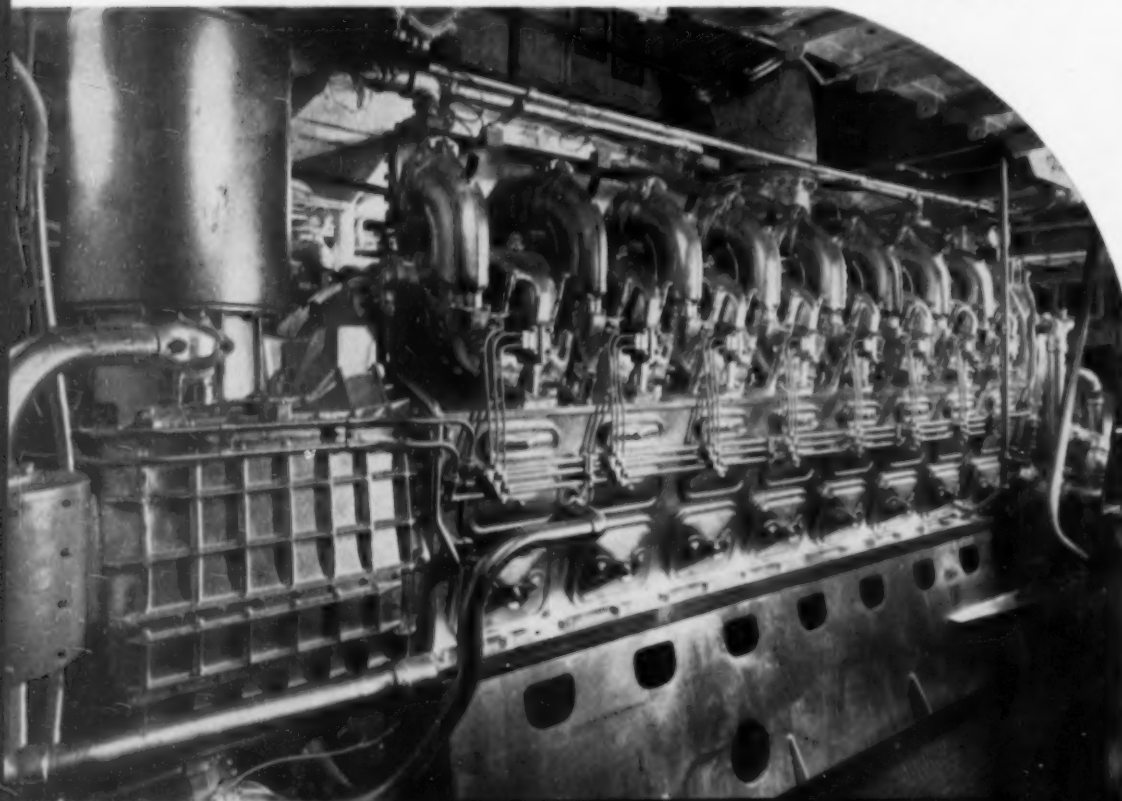
Operating In The

New York Harbor Area

By A. B. NEWELL

THE highest standard of tug boat elegance set by Barney Turecamo Sr. about a quarter century ago is fully reflected in his latest creation, the *Barney Turecamo* commissioned about the time the Motor Boat Show was in full swing. To our way of thinking the tug could have stolen the show if it had been on display somewhere near at hand. The celebrated *Turecamo Girls* built in 1932 created a sensation around New York, and first drew to public attention here and abroad the near luxury provided by Turecamo for crew members on a highly efficient, hard working boat. The extensive use of chrome plating earned her the some-

Engine room photo showing the GM Cleveland Diesel Model 1628A. It develops 1600 hp at 750 rpm. The governor is a Marquette. Metal hose visible at top is United Metal Hose.



what sportive nickname "Chrome Plated Tug". Prior to that there had been good steam tugs in the fleet and later more of the modern boats were added to the fleet.

The second boat to higher standards of design and finish was the *Turecamo Boys*, taken over by the Navy and lost during the war. A war-built tug was later purchased and named *Vincent Turecamo* and then a smaller one was built and named the *Turecamo Boys*, followed about four years ago by the *Marie J. Turecamo*. The present boat makes the fifth in a fleet for diversified operation ranging from coastwise open ocean towing to harbor and canal tugboat work.

Built by the Jakobson Shipyard of Oyster Bay, Long Island, to the design of Merritt Demarest, a Jersey City naval architect specializing in this class of work for many years, the new tug is intended for deep sea towing chiefly in the New England-Florida range of operation. However, the design is such that the tug can operate efficiently in various other services such as docking ships and general harbor



work. Demarest is the designer of the other boats operating in the fleet.

Dimensions are length 95 ft. 6 in., moulded beam 25 ft., depth of hull 12 ft. 3½ in. and the draft is about 11 ft. The tank capacities are 377 gal. lube oil, 475 gal. potable water, 1333 gal. wash water and 18,521 gal. fuel.

The main propulsion engine is a General Motors 16-278 A produced by the Cleveland Diesel Engine Division and rated 1600 hp at 750 rpm. Reverse and reduction gear is a Falk unit with a reduction ratio of 3.464:1 driving a Ferguson 3-blade manganese bronze propeller 9 ft. diameter and 7 ft. 8 in. pitch. The engine is fresh water cooled through the medium of Ross heat exchangers. Controls are Lakeshore Electric. The main diesel in addition to driving all of its own essential accessory equipment v-belt drives a Safety Car Heating and Lighting Company generator rated 25 kw, 125 volt, 200 amp used in conjunction with a 56-cell set of Exide batteries for general services under way and while in port.

There is, however, a Reiner Marine Diesel Auxiliary set which can be cut in at any time. This is powered by a 6-cylinder Hercules DRXC with 24-volt Auto Lite battery starting. A compact arrangement of v-belts and Twin Disc clutches drives the generator, compressor and general service pump combination typical of the Reiner units.

Other noteworthy equipment in the engineroom includes a Briggs Model CD-1 P16-175-BX lube oil purification system, Standard Sanitary heating boiler with Ray oil burner, Ingersoll-Rand stand-by compressor with 5 hp GE motor, Goulds fuel transfer pump, Deming fresh water pressure system, U.S. Electric tool grinder, Fairbanks-Morse wrecking pump and Pneumercator fuel gauge and Ross heat exchanger. The Sperry Electric steering gear is installed in the after end of the machinery space and the power capstan is driven by an under-deck Electro Dynamic 15 hp motor also in the engineroom. In general, machinery space is sound proofed or noise subdued very effectively.

The roomy pilothouse is fully equipped with mod-

ern aids to navigation and communications. Controls for propulsion are Lake Shore Electric, pilot wheel is part of the complete Sperry steering system, standard compass is a Kelvin-White spherical, R.C.A. supplied the radar, ship-to-ship and ship-to-shore radio phone as well as a direct line phone for communication with the main office. A Kahlenberg air horn and a pair of one-mile-ray searchlights by Portable Light Company about rounds out the navigational equipment.

There is a handsome sheer to the hull with ample freeboard forward indicating a fairly dry boat in head weather and good sea ability under all conditions. The superstructure is large enough and roomy enough to provide interior comfort and yet leave ample deck room. Symmetrical balance between hull form deckhouse, pilothouse and texas, with well proportioned stack are symbolic of a shipshape vessel. Like the hawsers and the mooring lines the fenders and the puddin's are Columbian rope and we believe they are better than the usual array of truck tires with which most tugs are made to look like a floating used tire shop.

No comment regarding a boat of this fleet would be ample without reference to how Barney Turecamo Sr. provides for the comfort of officers and men. All tugs have space limitation, but surely within those limitations nothing better could be provided in the matter of surroundings that make life livable for the men aboard. No doubt it is also a great contribution to operating efficiency.

The B. Turecamo Towing Company of Brooklyn, N. Y., is associated with the construction company of the same name and ownership in which diesel engines are the source of power for equipment on land. The trucks and mixers for delivering aggregates and ready mixed concrete are powered by diesels and the stationary power ashore is also diesel. The operation is efficient.

The pilot house of the *Barney Turecamo*. It features a Sperry steering wheel, Lakeshore controls and RCA radar and a Kahlenberg whistle.



THE USE OF HEAVY FUEL OILS IN TOSI 4-STROKE BUCHI TURBOCHARGED DIESEL ENGINES

FOR many years, systematic tests have been carried out on the test bed on diesel engines using heavy fuels, and for some time numerous diesel engines have been in regular service with heavy fuels. The greater number of the engines on which tests with heavy fuels were made and which are working with such fuels, run generally at relatively low speeds and have relatively large dimensions (cylinder diameter). In the case of engines with a medium speed and medium dimensions (speed 400 rpm and cylinder diameter 11.8 in.), the tests made with heavy fuels are, on the other hand, much fewer.

The Franco Tosi Company, when designing its new 4-stroke diesel engine turbocharged according to the Buchi system, with a medium speed (428 rpm) and medium dimensions (cylinder diameter 12.21 in.) considered that it would be of interest to investigate the behavior of the engine with heavy oils. The experiments on the test bed at the Tosi Works were carried out with three fuels: gas oil, diesel oil, and boiler fuel. The aim of these tests was to determine the behavior of the engine with the different fuels, and to determine the influence of the Buchi system of exhaust turbocharging on the working of the engine, particularly when using boiler fuel.

The engine on which the tests were made is a Tosi diesel four-stroke engine, type Q 34, having the following characteristics: cylinder bore, 12.21 in.; stroke, 17.72 in.; number of cylinders, 6; swept volume per cylinder, 2072 cu. in.; swept volume, total, 12,430 cu. in.; speed, 428 rpm; compression ratio, appr., 12.1; mean piston speed, 1264 ft./min.

Fig. 1 shows a transverse section through the Tosi Q 34. The engine is of the plunger-piston type, equipped with two inlet and two exhaust valves. The cylinder liners are cooled efficiently by the Tosi system. The pistons are made of a light-metal alloy. The turbocharging set was built by Tosi

Editor's Note

The excerpts on these two pages are from an article by Prof. Eng. Corrado Casci, Titular Professor at the Academy for Aviation at Nisida and Teacher at the School of Technology Milan for Aircraft, and Doc. Eng. Federico Scirocco, Technical Superintendent of Franco Tosi Ltd., Legnano, Italy, which appeared in the technical journal "L'Ingegnere," official publication of the National Italian Society of Engineers and Architects. The Tosi engine described in the write-up incorporates a Buchi designed turbocharger and operates on the Buchi System of Turbocharging.

under license from Buchi and consists of a single-stage compressor of the centrifugal blower type driven by an exhaust gas turbine of the centripetal type, also having a single stage. The shaft on which the radial compressor is fitted, is in one piece with the rotor of the turbine, and, while the blading of the compressor is directly supported by the bearings mounted in the central part and surrounding the shaft, the rotor of the turbine is overhung.

The compressor consists of a rotor of the centrifugal type with purely radial blades, and of a bladed diffuser of curvilinear axis with transverse sections passing from an elliptical to a circular shape. Between the two bladed discs of the compressor and of the turbine, a recess is provided in the stator, and there water circulates, thus allowing of a fairly intense cooling and so diminishing the introduction of heat during compression. In order to improve the efficiency of charging of the engine, the compressor air passes through a cooler before entering the cylinders. The six cylinders of the engine exhaust two by two into three collectors. Cylinders 1 and 6 exhaust into the first collector; cylinders 2 and 5 exhaust into the second collector;

Cylinder head of the Tosi Q 34 engine.

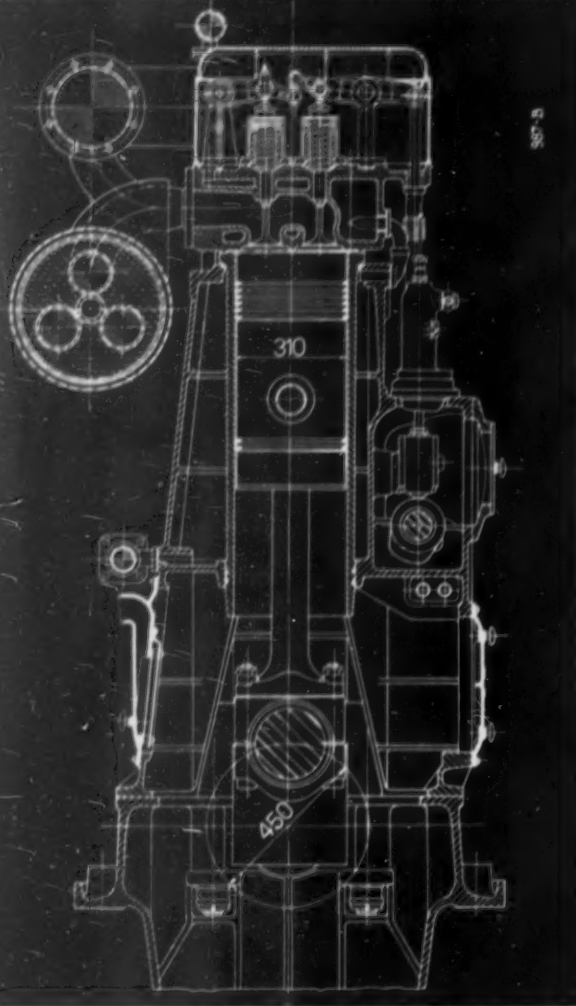
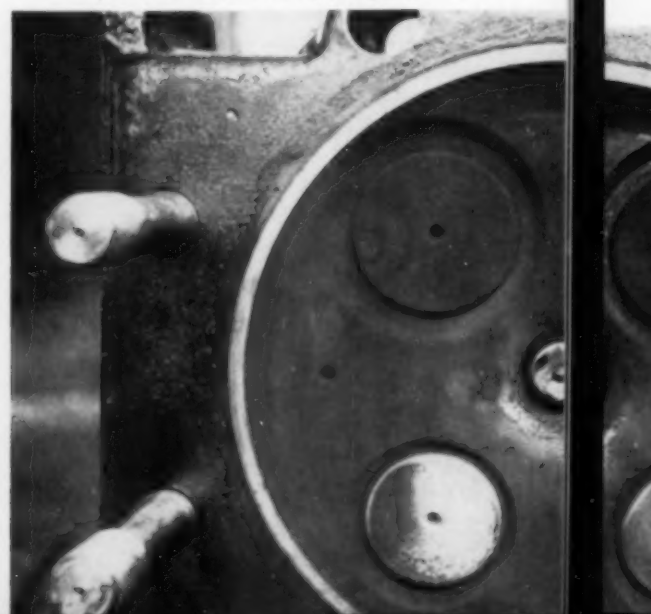


Fig. 1. Cross-section of the Tosi Q 34 engine.

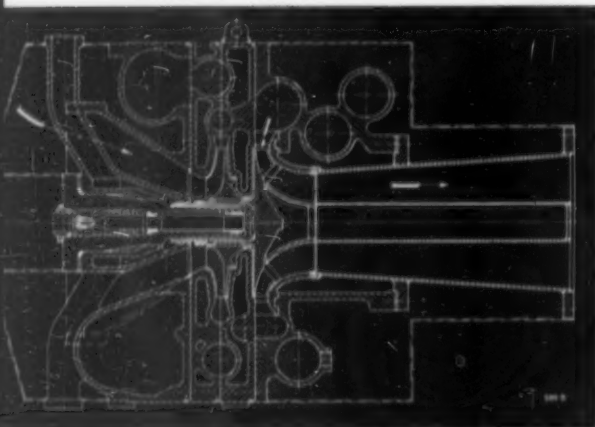
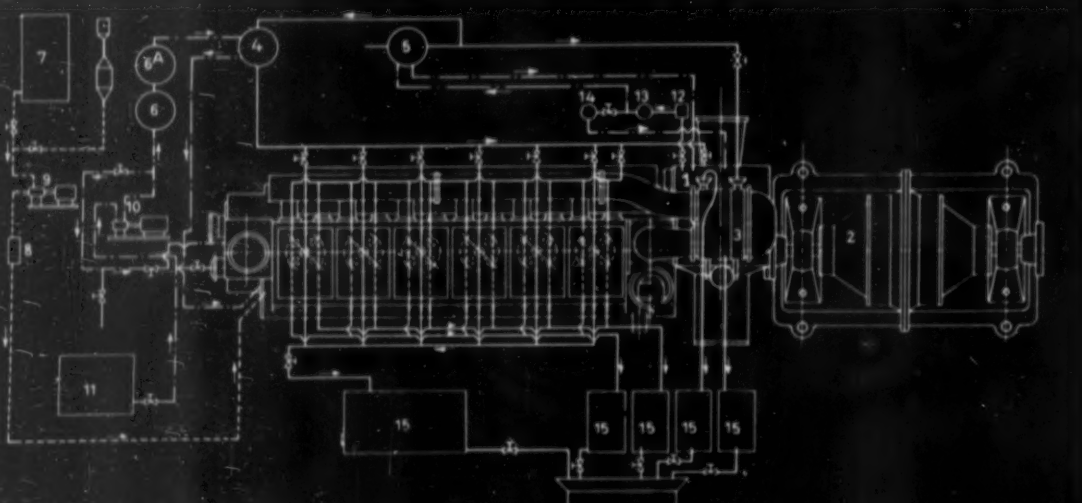


Fig. 2. Longitudinal section of the Tosi-Buchi turbocharger.

Fig. 3. The experimental plant used in the tests. 1. Tosi-Buchi turbocharger. 2. Brake. 3. Air cooler. 4. Lubricating oil cooler, engine. 5. Lubricating oil cooler, turbocharger. 6 Oil filter. 6A. Winslow oil conditioner. 7. Fuel tank. 8. Fuel filter. 9. Fuel pump. 10. Circu-conditioner. 14. Lubrication oil pump for turbocharger. 15. Laminated filter. 16. Winslow conditioner for turbocharger. 17. Water outlet tanks.



tor; cylinders number 3 and 4 exhaust into the third collector.

The three exhaust ducts are constructed as spirals in the outer part of the rotor of the centripetal turbine, and then open into the distributors which lead the gas to the blades of the turbine. The whole turbocharging set—compressor and gas turbine—is shown in longitudinal section in Fig. 2 which shows clearly the centripetal turbine, the radial compressor, the inlet ducts of the turbine and mechanical arrangement of the complete set. The gas, after having done work in the centripetal turbine, enters an ejector-diffusor, divided into three sectors, corresponding to the three sectors of the turbine where the gases give up work when coming from the three exhaust collectors. The centripetal turbine is particularly suitable for use in turbocharging sets of the type in question.

As is well known, other conditions being equal, a centripetal turbine has a higher efficiency than an axial turbine, so that it can absorb a greater heat drop in the turbine blades. The centripetal turbine generally causes an over-pressure produced by the centrifugal force when the flow is very small. This phenomenon occurs at the end of the scavenging phase, but does not cause any disturbance in the scavenging itself. This back-pressure is, on the other hand, very small: a theoretical calculation shows that, when the engine in question is working with an output of 887.6 hp, it is of the order of 1.28 psi while the pressure of the air is 6.40 psi. But this overpressure is compensated by the fact that the diffusor of the turbine causes a pressure lower than atmospheric at the outlet from the turbine itself.

The ejector-diffusor has two advantages, viz.: a) The diffusors partly recuperate the kinetic energy of the gas at the exhaust and diminish the pressure at the outlet from the turbine, consequently increasing the enthalpy drop in the turbine and thus the work produced in the turbine itself. b) At the outlet from the turbine, the three diffusors are in connection with each other, in such a way that the depression caused in one of them is also produced in the other two, and this is of great importance for the scavenging.

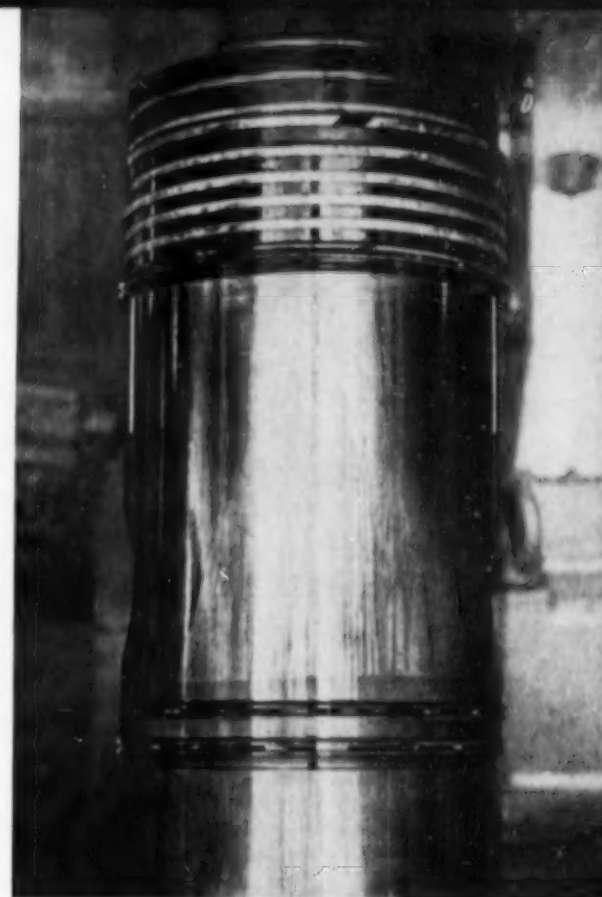
The experimental arrangement adopted in these tests is illustrated in Fig. 3. From the test results

the following deductions may be drawn: The specific fuel consumption of the engine working with the three different fuels show a fairly extensive minimum zone, which allows the engine to be run with a good efficiency over an amply long range.

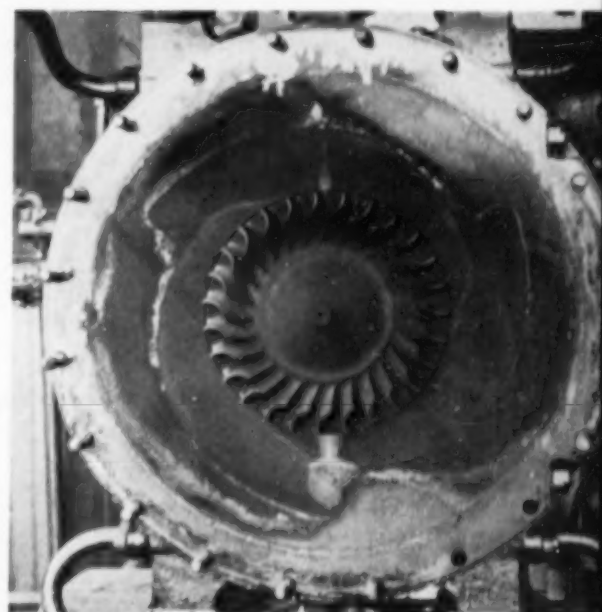
This range extends from a mean effective pressure of about 78 psi to a mean effective pressure of about 135 psi. The fuel consumption per bhp/hr. increase when changing from gas oil to diesel oil and from diesel oil to boiler fuel, but this increase is substantially compensated by the diminished calorific value, so that the efficiency of the engine remains practically unchanged with all the three fuels, that were used. The pressure of the air supplied to the engine is higher than the pressure of the gases, down to a very low output of the engine (about 160 hp), and this is a proof of the high efficiency of the Tosi-Buchi turbocharging set. The mean temperature of the gases, measured at the inlet to the turbine, shows very moderate values, the maximum being 790°F when the engine is working with a mean effective pressure of 138 psi.

It is believed that the satisfactory results obtained in the tests when working the Tosi Q 34 with boiler fuel, must be attributed to the particular characteristics of the engine, and primarily to the turbocharging, which makes it possible to carry out combustion with a great excess of air introduced into the cylinders at a low temperature and a great density, thus practically eliminating the disadvantages of the relatively slow combustion of very heavy fuels. On examining the temperatures measured at the cylinder heads of the turbocharged engine, it was found that the negative characteristics of the combustion of boiler fuel in comparison with the other fuels are practically eliminated by the turbocharging. It is also believed that particular importance must be attributed to the special conditions of the Tosi cooling system for the cylinder liners, and also to the adoption of a light metal alloy for the pistons, which gives a better heat transmission. In this manner, the detergent oil is best able to exercise its detergent action on the pistons and particularly on the piston rings.

It can be concluded that the use of good turbocharging and energetic cooling of the liners, favor the adoption of boiler fuel also for 4-stroke diesel engines of medium dimensions and which operate at a moderate speed.



Piston of the Tosi engine.



Rotor of the Tosi-Buchi turbocharger.

Exhaust duct of the Tosi-Buchi turbocharger.



THE NEW HERCULES SERIES DD DIESEL ENGINE

A New Line of Diesel Engines Augments The Hercules Line

ADDING to its line of engines the Hercules Motors Corporation began production earlier this year on two new series of diesel engines to augment its established lines. Its line of solid injection, turbulence chamber type of diesel was introduced in 1932. Their speeds made them adaptable as replacements for gasoline engines and as optional power in many instances.

The new line of DD Series direct injection diesel engines is available in three different bore sizes and in 4- and 6-cyl construction. Also underway in the company's plan to meet its customers' needs is a 3-cyl model which would match the bore sizes of the 4- and 6-cyl engines. A high degree of interchangeability, economy in manufacture, greater economy and convenience in servicing results in a reduction of necessary parts stocks for adequate field servicing.

The direct injection, open combustion principle was selected along with an overhead valve arrangement. Selection of this type of combustion permits the building of narrow cylinder blocks and the use of flat deck cylinder heads. Fuel injection nozzles are positioned in the cylinder head slightly off the centerline of the cylinder bore. The nozzles are

of the orifice type. Compression ratios are varied by the expedient of changing pistons. A "Mexican Hat" type of combustion space is arranged in the crown of the piston.

The DD Series are permitted to operate with maximum full-load speeds up to 2,000 rpm. For applications requiring higher speeds, Hercules has available its high speed turbulence chamber type of diesel. The crankshaft is of ample proportions and has main bearings on each side of every crankpin.

The 3-cyl engine, therefore, is designed with 4 main bearings. The 4-cyl has 5 main bearings. The six has 7 main bearings. All crankshaft bearings for the main journals as well as for the crankpins are the precision type. The bearing surfaces are induction hardened.

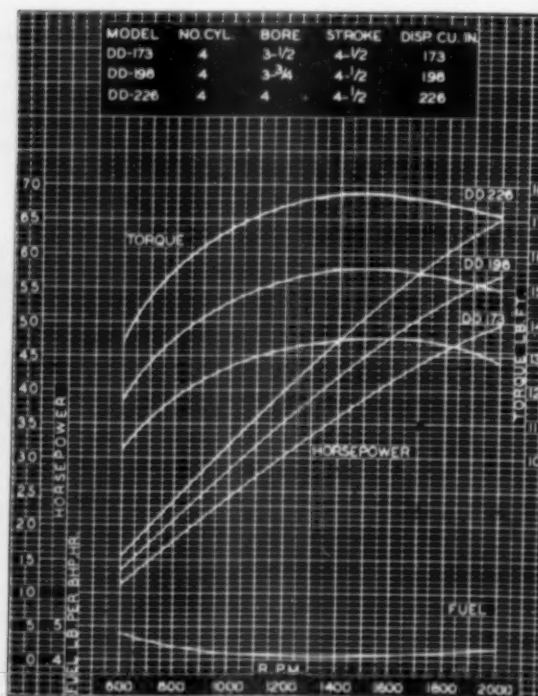
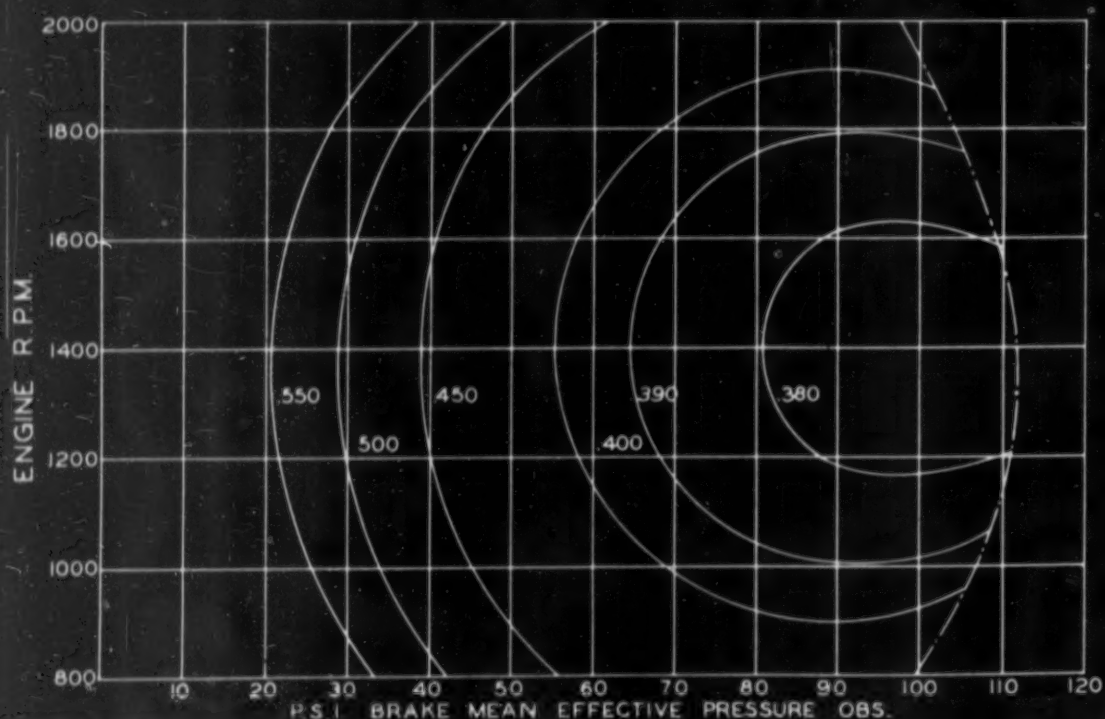
Connecting rods of conventional design are drop-forged, fitted with full-floating piston pins. Pistons with a liberal ratio of length to diameter are designed for heavy duty operation. There are 3 compression and 2 lube oil control rings. Precision type dry liners are provided for the 3½-in. and 3¾-in. bore engines and can be inserted with a "push" fit, making for easy replacement in the field. The

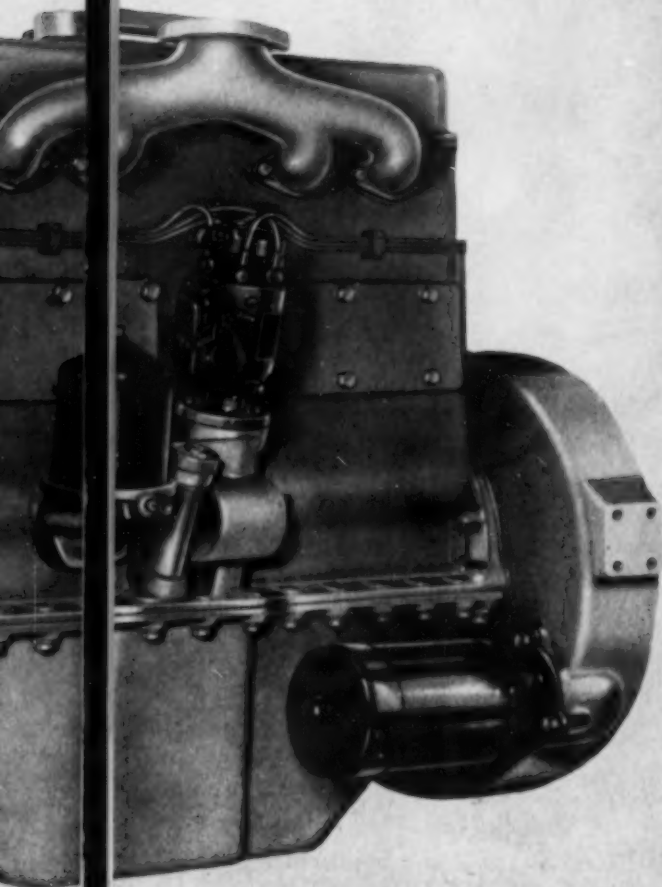


4-in. engines are furnished without sleeves. The blocks are cast from a suitable alloy iron to insure excellent wearing qualities. The smaller bores are available without sleeves at the buyer's option.

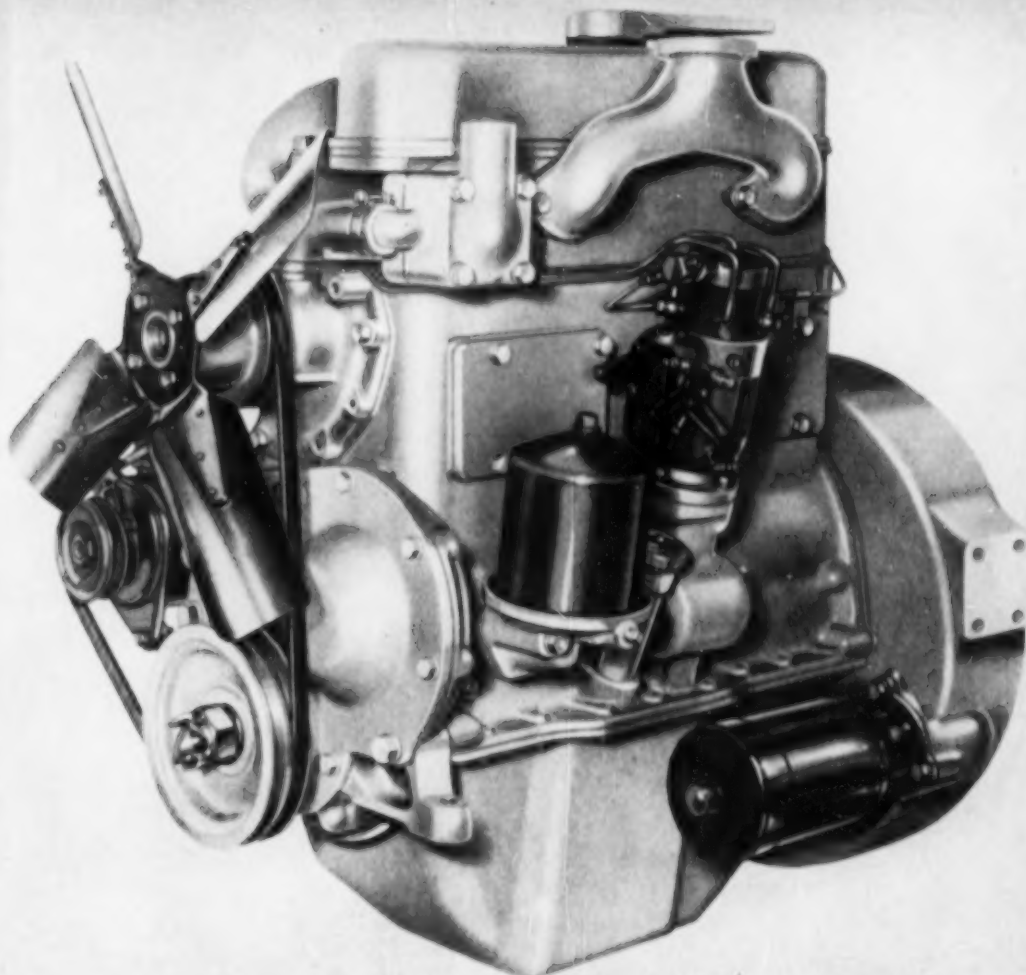
The water pump for the basic engine is mounted on the front end of the block. It is combined with the fan and driven by belt from the crankshaft. The pump's design is such that it can be mounted at either end of the block. Bodies of pumps for different nominal fan and pump heights

SPECIFIC FUEL CONSUMPTION A FUNCTION OF ENGINE SPEED AND LOAD





The Hercules 6-cyl DD Series diesel engine. Three models of this DD 6-cyl engine develop 75, 85 and 97 hp.



The 4-cyl DD diesel. Three models are comparable in bore and stroke to the three 6-cyl engines. They are 3 1/2 x 4 1/2, 48 hp; 3 3/4 x 4 1/2, 57 hp; 4 x 4 1/2, 65 hp. Rated power is developed at 2000 rpm.

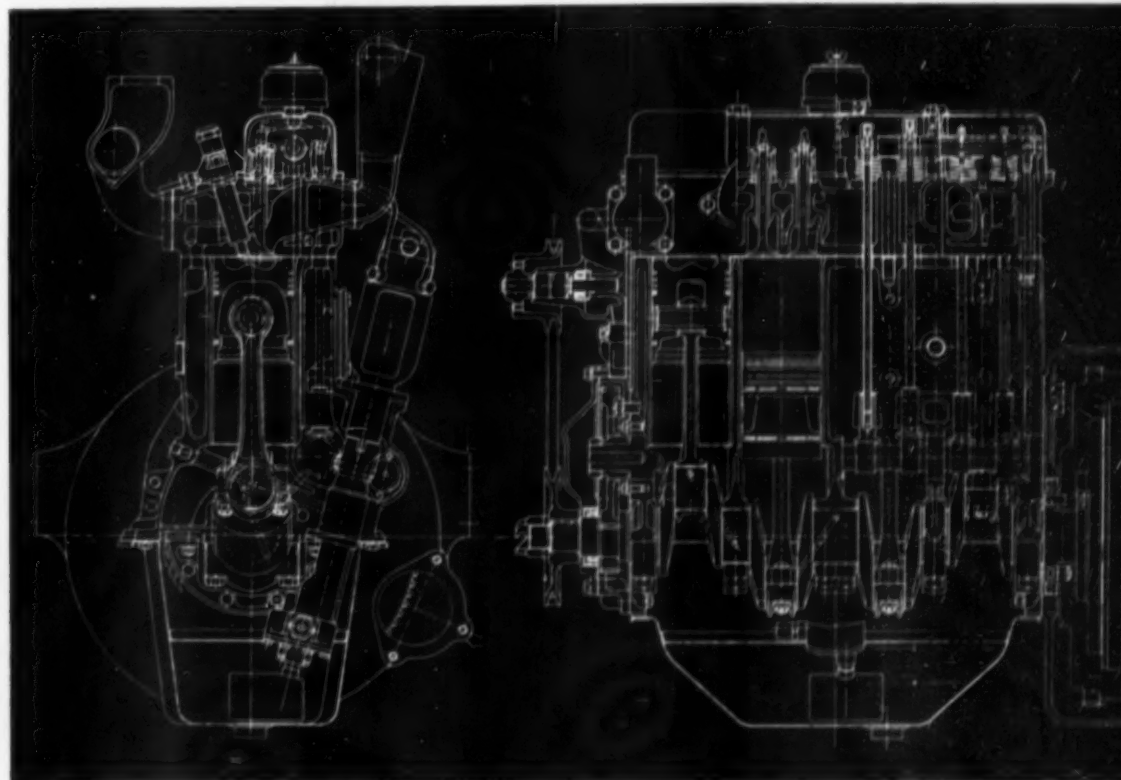
can be produced from combination pattern equipment and by using common tools and fixtures.

Use of a separate casting to house the timing gear enables Hercules to offer the engines with a multitude of different front mountings at competitive cost and at the same time permits the economical building of the engine with a wide variety of different gear arrangements. Engines are available

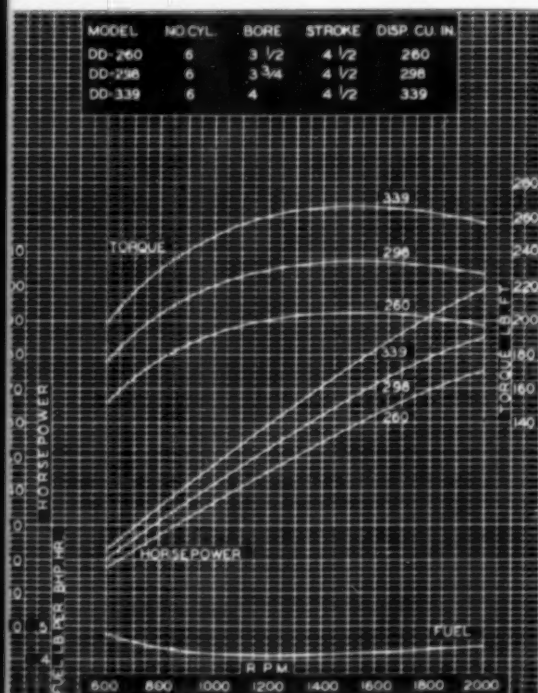
with special front ends which incorporate positive drives for accessories such as hydraulic pumps where gear drive is used to shorten the length or width of engines and eliminate belt arrangements.

These are some of the features which recommend these new diesels for applications where compactness, flexibility of mounting, ease of servicing and interchangeability characteristics merit their use.

Schematic drawing of the new Hercules DD Series diesel engine.



MODEL	NO. CYL.	BORE	STROKE	DISP. CU. IN.
DD-260	6	3 1/2	4 1/2	260
DD-298	6	3 3/4	4 1/2	298
DD-339	6	4	4 1/2	339





Harold Ellis of Ellis Diesel Sales & Service, Ft. Lauderdale, Florida, who sold and installed the new GM diesels and Miss Betty Carstairs. Miss Carstairs is the holder of the Duke of York Gold Cup, Belgium Trophy and John Ward Trophy plus numerous other speed boat trophies.

'SAINT PETE'

By ED DENNIS

SAFETY at sea, greater power and longer cruising range is what Miss Betty Carstairs had in mind when she repowered the 63 foot *Saint Pete* from gasoline to diesel. A whole book could be written on the adventures of Betty Carstairs, international speed boat racer, "Queen of Whale Cay," philanthropist, airplane pilot and holder of over 50 cups for speed boat racing.

The *Saint Pete* is a handsome ship, the long sweep of its lines give it a sleek appearance. It has the usual interior arrangements of a regular 63 foot Air Sea Rescue vessel. Up forward is a 4 bunk stateroom with a head plus water tight bulk-heading, then comes the passageway which leads to the living room and bath. Leading up from the living room is a short stairway going directly into the combination pilot house-chart room-radio room, which also serves as inside passageway from the forward compartment to the living room and engine room.

With her high flying bridge, good all around visi-



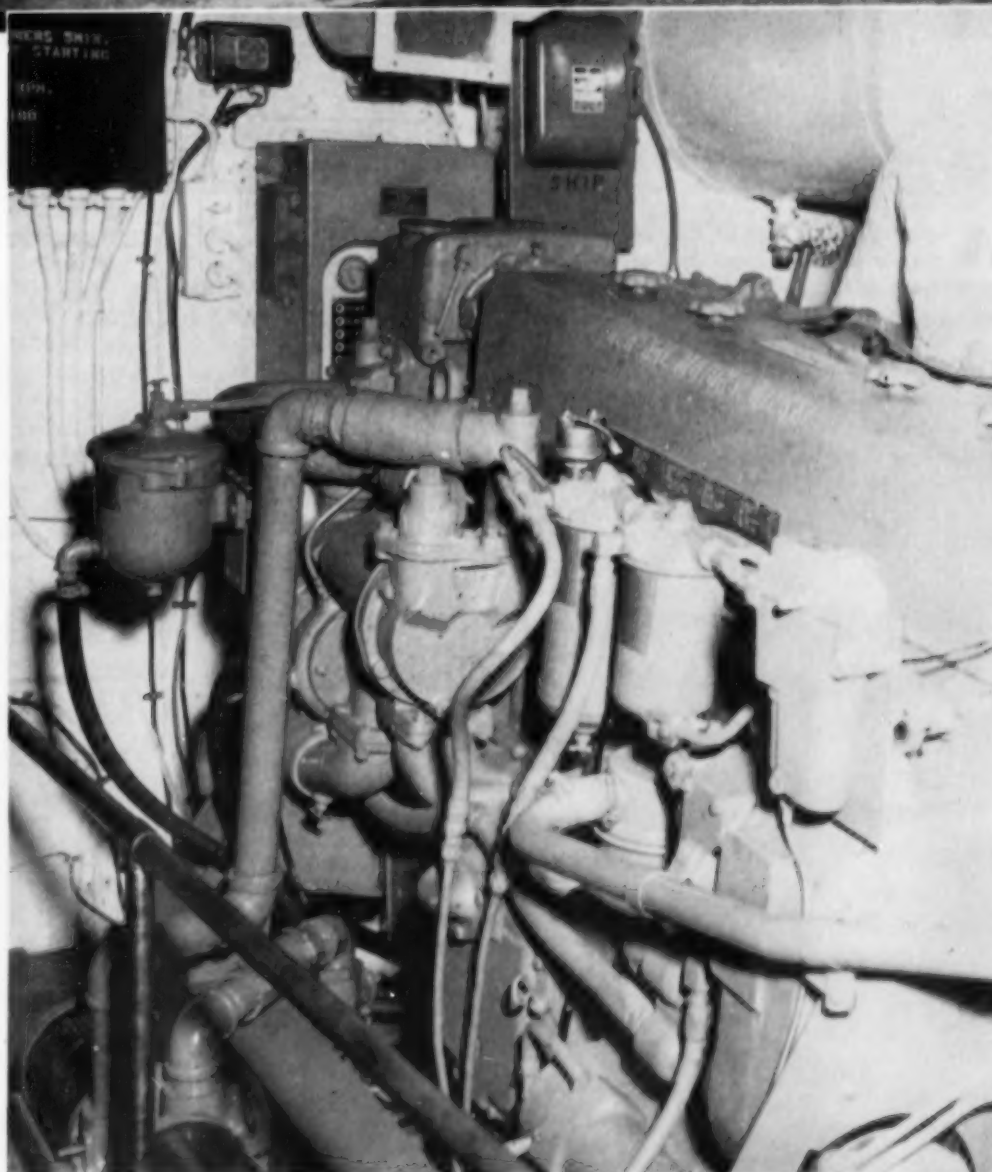
The maneuverability of the *Saint Pete* during her trial runs was "beautiful." Her two new 300 hp GM diesels gave her instant response. Miss Betty Carstairs was at the controls.

One of the GM Detroit Diesels aboard the *Saint Pete*. They are Model 6-110 rated 300 hp each, equipped with Perry water filters, Full Flo fuel oil strainers and a 2-in. duplex sea strainer and Aeroquip hose.

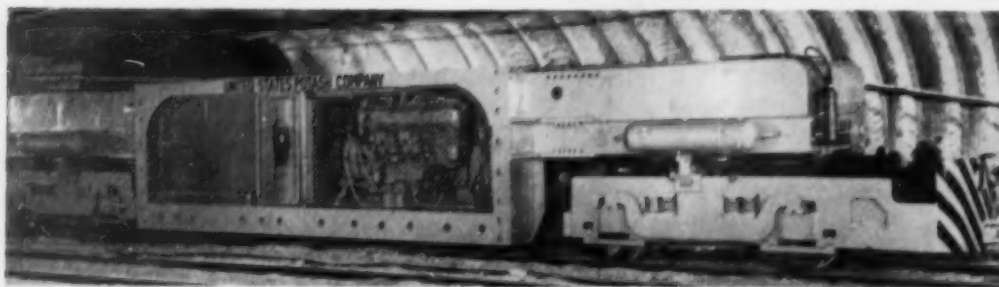
bility has been retained for the helmsman. Full pilot house controls make it possible for one person to operate it under all conditions. Aft of the living room, the bulkheads of this space, besides sealing off the engine compartment, create a water tight bulkheading amidships. This is the point of greatest interest to Miss Carstairs as here are the two new 6-110 General Motors diesels. Each is rated 300 hp at 2000 rpm through GM Torqmatic marine gears with a straight drive. No reduction is needed.

Each engine turns a 24x18 Columbian 3 blade propeller giving the *Saint Pete* a top speed of better than 24 mph. The new compact diesel engines take up less space and gone is the ever present danger of fire inherent with the presence of the old gasoline engines. A model 3MDSP Onan 3 kw diesel generating set was also installed by Ellis Diesel Sales & Service as an auxiliary power plant.

Whale Cay, where Miss Carstairs operates a plantation, is seven miles long by about a mile wide and is in the Berry Island group, to the north of Andros Island off the Florida coast. The island has its own diesel generating plant as well as a small dieselized cargo vessel. During the summer months Miss Carstairs operates a camp for underprivileged children from Nassau, B.I. Since the conversion to diesel *Saint Pete* has really been going places.



Underground Locomotive



A locomotive, not much higher than an auto and said to be the most powerful underground diesel-electric in the world, is operating at the Carlsbad, New Mexico U.S. Potash mine. Built by the General Electric Company's Erie, Pa., locomotive and car equipment plant, the locomotive is just six feet high, over 47 feet long, and was built for high underground speeds in the haulage ways of the Potash mine. It can travel 37.5 miles per

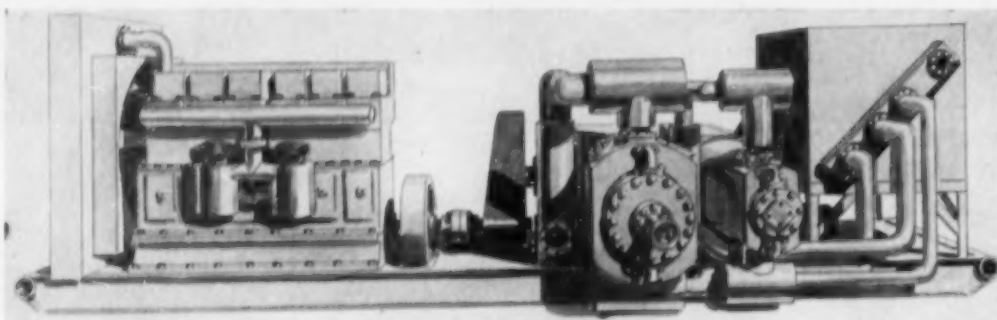
hour and its length and weight probably make it the largest underground diesel-electric built to date.

Taking advantage of every possible inch of mine clearance, 420 horsepower was packed into this 40-ton locomotive which, successfully and snugly, negotiates the mine's underground burrows in record time. Unusual size was necessary to accomplish underground work without hooking up locomotive

units in tandem. The Potash locomotive is capable of pulling 800 to 1000 tons on a level track depending on track conditions. A special exhaust-gas conditioning system reduces the temperature of the engine gas exhaust from 1000°F to 160°F or less by "scrubbing" the gases in large water tanks.

To get the locomotive into the mine, it had to be dismantled and reassembled underground. There was no other way of getting it through the mine's main opening—a shaft measuring just 46 inches by 66 inches except by lowering it into the mine in pieces. The completely assembled locomotive is 47 feet 7 inches long, seven feet wide, and six feet high. By building the frame of a bolted construction, G-E engineers were able to take the locomotive completely apart, lower it into the mine, and reassemble it again right on the 42-inch-gage track on the mine's floor.

Gas Pick-up Compressor



A compact, highly efficient reciprocating compressor of special importance to the petroleum, petro-chemical and mining industries has been announced by Stanley E. Johnson, vice president and director of sales for The Cooper-Bessemer Corporation. The latest compressor, known as the FMP, ranges in capacity from 100 to 500 hp and is expected to find widespread use in field gathering systems, gas lift operations, repressuring and booster service installations, according to Mr. Johnson.

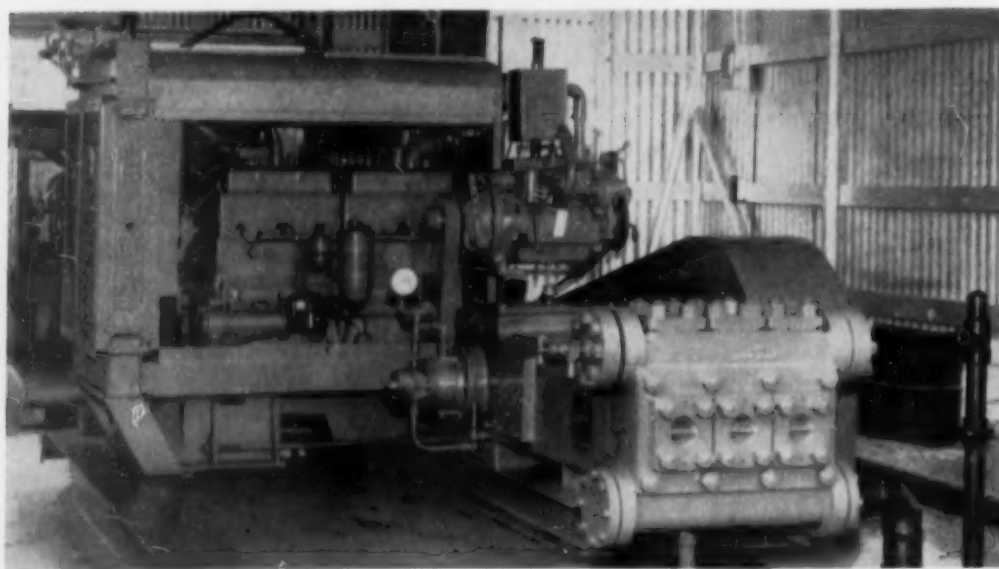
The demand for a highly compact, yet rugged compressor, has been increasing steadily over the past several years, Mr. Johnson points out. As gas fields become more and more depleted, auxiliary pumping services are highly essential in assuring maximum return from gas wells. In the development of Cooper-Bessemer's newest compressor unit, the FMP, special attention is devoted to peak operating dependability under the severest conditions. This basic requirement is particularly important,

since compressor units of this type must of necessity operate continuously in remote locations, often with little or no attention.

Basic engineering developments already perfected and used in Cooper-Bessemer's successful Type GMXD, V-angle compressors have been incorporated in this newest unit, explained Mr. Johnson. Ruggedly built and operated at a relatively slow speed, the FMP compressor provides the stamina needed for efficient operation under the most adverse conditions. For maximum versatility, cylinders of the compressor can be mounted for single-stage compression, in tandem or as twin units for two or more stages, adapting the unit to a wide range of services. To achieve maximum mobility in the field, the FMP compressor can be skid mounted to operate as a portable unit or can be mounted on a conventional concrete base. The compressor may be belt-driven from an electric motor or power-driven from a conventional gas or diesel engine.

ITS NEW

High Pressure Pumping



THIS equipment is used by the Tide Water Associated Oil Company to pump extremely salty water on a high pressure water injection job near New Hope, Texas. The Triplex F-90 Pump, in foreground, made by The National Supply Co., is powered by a Buda 6 MO-970 engine. The 36-inch PD 12C sheave of the pump is linked with the 9.8-inch PD 12C sheave of the engine by means of 12-C-180 "V" belts. The equipment is mounted on portable steel skids, to facilitate moving it to another location if necessary.

Running at 200 rpm, the pump discharges approximately 700 barrels of water a day into the Pittsburgh sand, 7800 feet deep, at a pressure of 4400 pounds per square inch. Occasionally the pressure goes as high as 4750 pounds per square inch. Tide Water started the first such unit in operation in August, 1954, and started a second unit, a portion of which is in the background, November, 1954.

INSURANCE for America's future are the outposts and weather stations which are located a few hundred miles from the North Pole. These are of more or less recent origin and have been established in the belief that World War III, should it occur, may well be fought in the shadows of the Pole. This possibility has made it extremely important for those who are responsible for U.S. security to give a large share of attention to conquering the elements in the frozen North. In this endeavor the U.S. Government and the military services have enlisted the aid of some of the nation's large industrial organizations, among them Perfection Industries, Inc., of Cleveland, Ohio.

This company has been co-operating with government and military officials on winterization for the past dozen years. This co-operation started in 1942 and resulted in the building of a small Arctic laboratory on the fifth floor of the company's Engineering Research Center. Here, all sorts of heating devices are tested, to determine how best to make engines start and continue to operate at temperatures as low as -65°F to minus 70°F .

Out of this research has come a line of engine heating equipment which is currently helping the military services best the elements in the coldest spots on earth. However, as activities were stepped up in the polar regions, the need for a huge chamber



A dieselized Navy LVTP-5 is being moved into the Perfection cold room for testing. Many such military vehicles are brought in for testing and winterization.

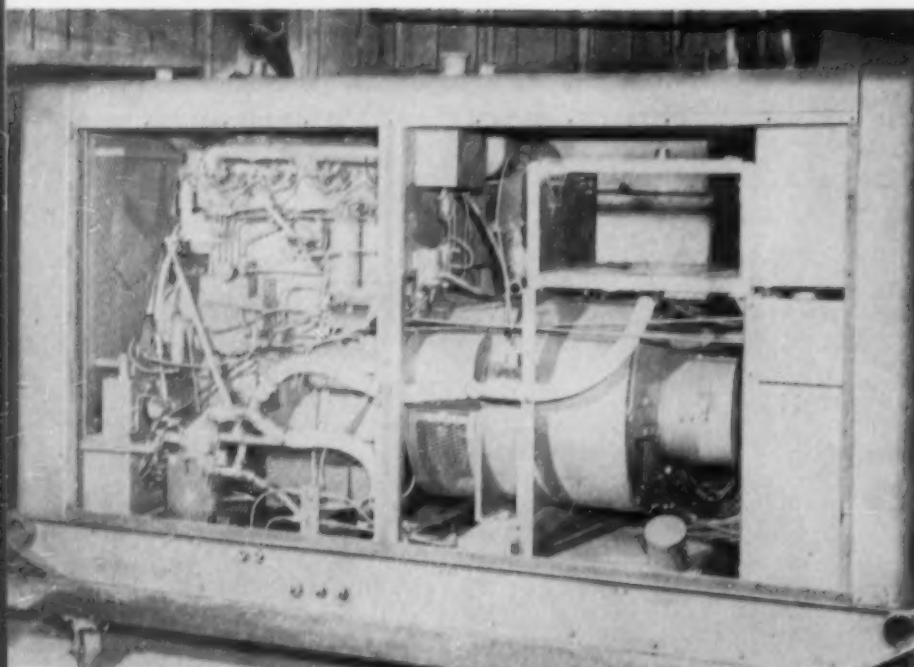
ARCTIC WEATHER TO ORDER

Charles Szell and Howard Holiday illustrate the difference in Arctic and regular oils and anti-freezes subjected to -70° temperatures. The oil and anti-freeze on the left are special Arctic types. The regular types are on the right.

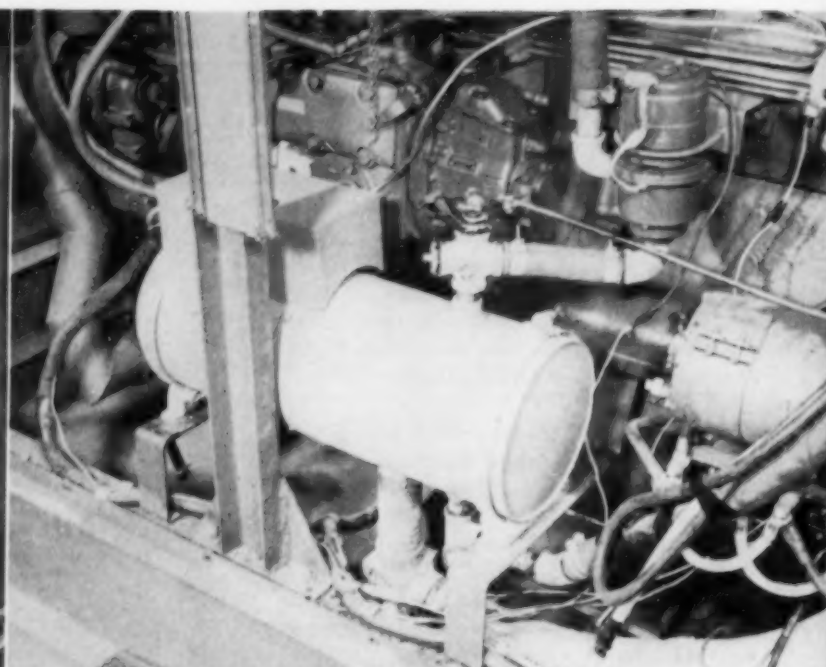
in which to test military and commercial vehicles became apparent. Perfection met this challenge by building a large sub-zero testing laboratory which is capable of simultaneously housing two Greyhound buses. It will also accommodate some of the largest military vehicles produced for the U.S. Government. This 90-below zero test laboratory, located adjacent to the Engineering Building, was completed two years ago. The cold room proper is 32 ft. 4 inches long by 30 ft. 8 inches wide by 16 ft. high. At -65°F , refrigeration capacity is $13\frac{1}{2}$ tons, while at -85°F the capacity is 7 tons. Refrigeration capacity is provided by a 2-stage Freon 22 refrigeration system. This refrigeration system includes two low stage compressors operating in parallel. These two compressors manifold into the suction of the high stage compressor. Each low stage compressor operates in conjunction with its one evaporator coil. Each of these evaporator units has a capacity of 7.1 tons of refrigeration with a 10-degree temperature differential, and a blower which delivers 15,000 cfm. Total air delivery of the two units is 30,000 cfm and results in room volume recirculation every 30 seconds. The refrigeration system is charged with a total of 300 to 400 pounds of Freon 22.

The refrigeration system is capable of maintaining a temperature of -86°F to -90°F for at least 72 hours continuously. It is also capable of maintaining -63°F to -67°F with an equipment heat load of 38,200 Btu/hour. An auxiliary fan is capable of





This Ready Power Co. 30 kw generator plant is shown in the cold room ready for test. It is powered by an International diesel. The battery is a Two Type 8T.



A Consolidated Diesel Electric Co. 100 kw diesel generator powered by a Buda and having a battery Four Type 2H. The unit has been successfully winterized.

producing a wind of 25 mph at -65°F . Snow making facilities are also available. At $+70^{\circ}\text{F}$, 200 cfm of exhaust products can be withdrawn from the room. The sub-zero room itself is enclosed in a 60 x 60 x 22 foot structure which contains all of the equipment necessary to carry out tests at loads up to 15 hp at -65°F .

Cold room personnel—engineers and technicians—are outfitted in parkas with fur-lined hoods, flight-type trousers, flight boots, nylon gloves, fur-lined leather gloves, heavy wool-lined leather gloves and face masks to protect them from the extreme temperatures at which tests are conducted.

Auxiliary equipment to aid in handling and con-

ducting tests include a lift truck with a 6,000 pound capacity. This unit has an allowable overload of 25 percent. Battery chargers and an acetylene welding unit (portable) are also handy to test operations. Load banks capable of approximately 7 to 117 kw at 120 volts, 208 volts, 416 volts, single or three phase, may be used upon request. To aid in fabrication and testing of winterization kits, engine generators and other equipment, there are several laboratories and shops within the adjacent Engineering Building. These include electrical, chemical, metallurgical, photographic and fuel laboratories and sheet metal and machine shops.

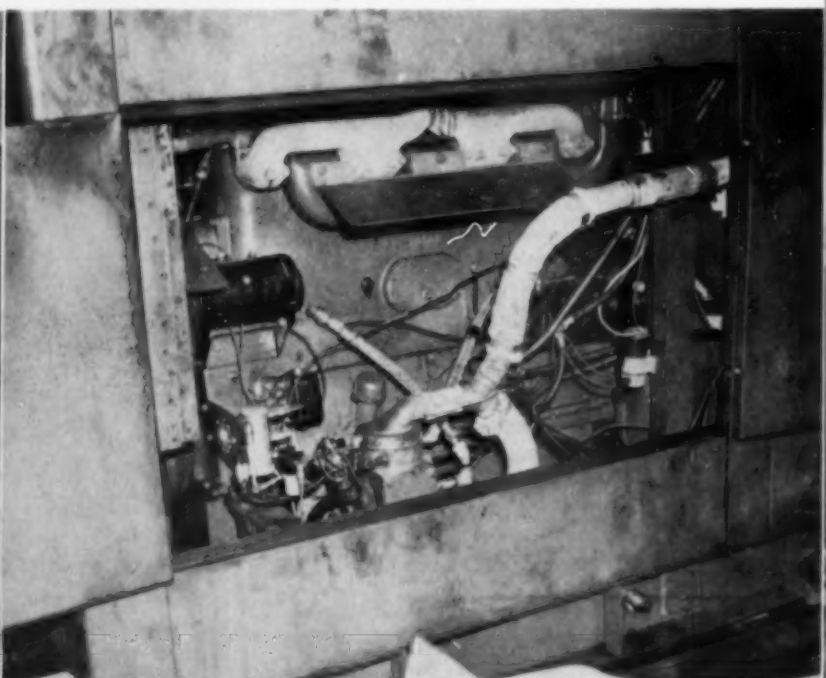
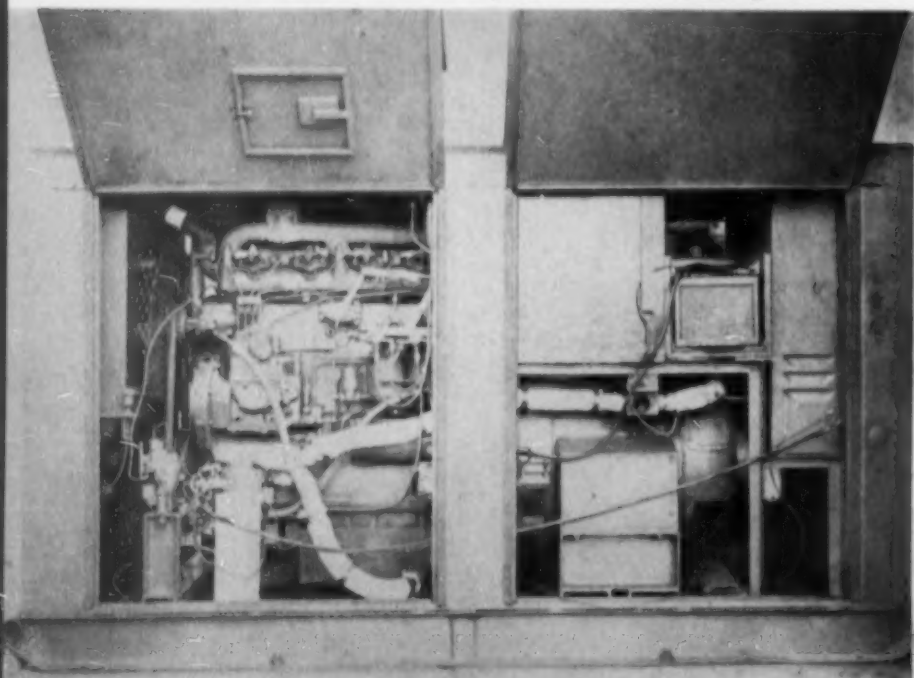
There are five temperature-measuring instruments in use in this large polar laboratory. These are

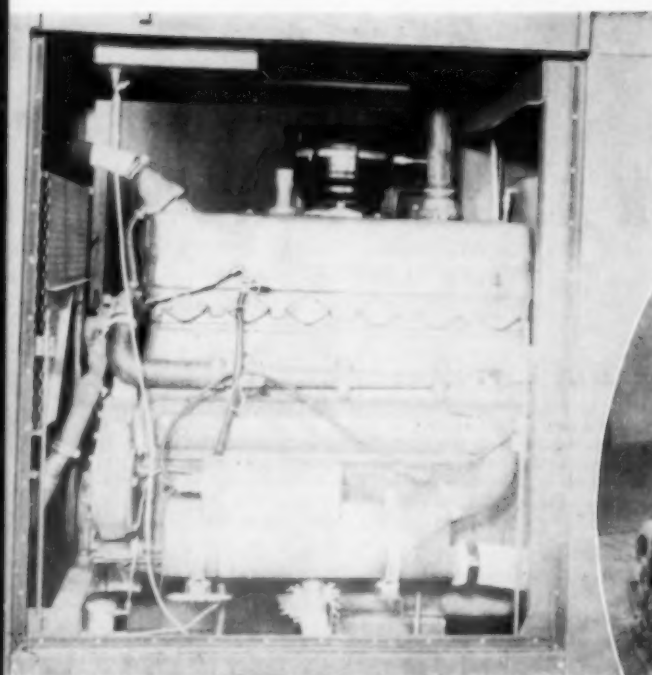
mounted on an instrument panel between two observation windows of the cold room: (1) 24-point indicating potentiometer pyrometer, -100°F to $+1600^{\circ}\text{F}$, (1) 48-point indicating potentiometer pyrometer, -100°F to $+1100^{\circ}\text{F}$, (2) 16-point recording potentiometer pyrometers, -100°F to $+500^{\circ}\text{F}$, (1) 16-point recording potentiometer, -50°F to $+1200^{\circ}\text{F}$.

These prove valuable in conducting tests on vehicular and engine generator equipment. During each test it is important to know how well the winterization kit under test is heating the critical components of the units. These tests are conducted at ambient temperatures of -70°F , -65°F , -40°F , -25°F and 0°F . Below -70°F storage tests only are

Another of the many units which have undergone winterization. This Hill diesel 30 kw generator has a Model 6K engine.

An International Model UD14 diesel powers this O'Brien Diesel-electric Co. unit, which has just been through the cold room.





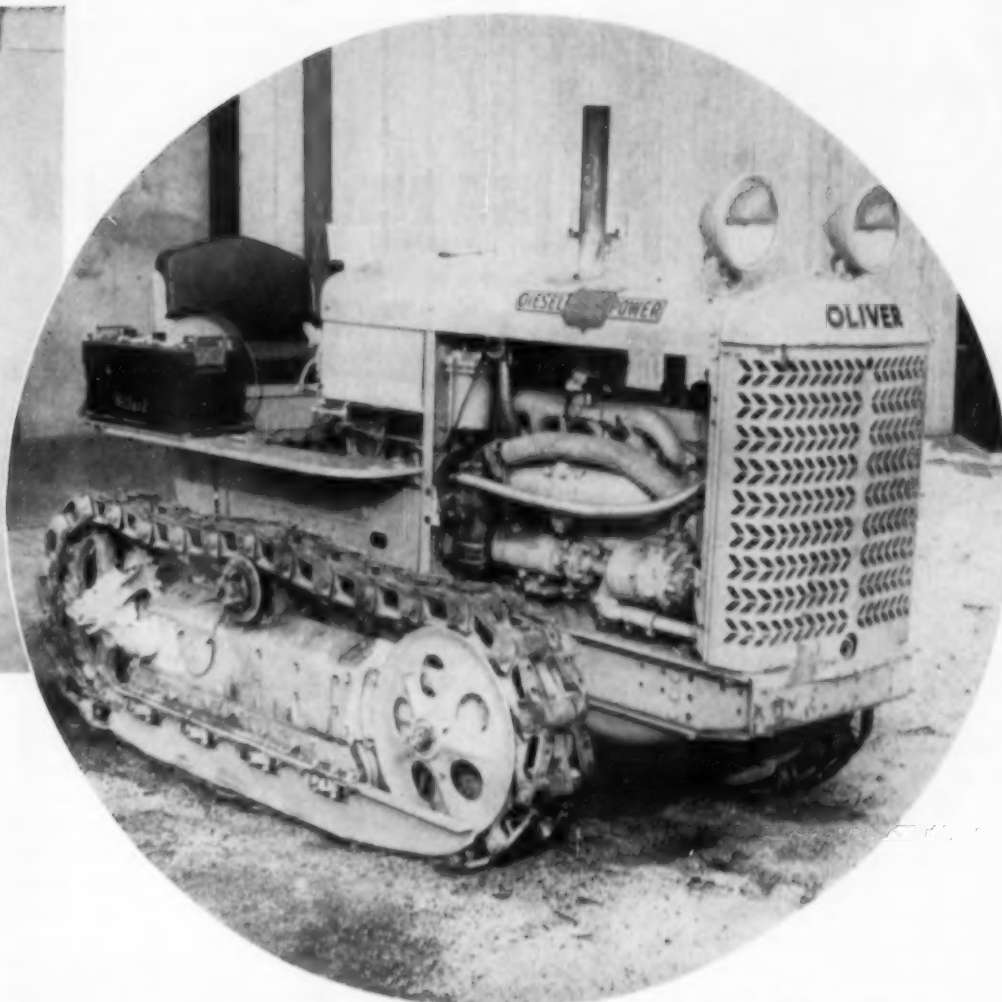
An International Vermont 60 kw power package after winterization. The diesel is a Buda and the battery an Auto-Lite.

conducted. These tests are conducted at -80°F and -85°F . The recording-type instruments save considerable time, in that readings are recorded automatically every few minutes. This eliminates the need for men to take temperature data while a test is in progress. The indicating-type meters prove useful in checking temperatures at one's convenience. A temperature recording controller serves to control the room operation temperature to within $\pm 2^{\circ}\text{F}$ at any temperature from -65°F to -85°F .

A portable three-channel recording oscillograph is utilized for recording engine starting current and voltage as well as cranking speed. To measure starting currents of various magnitudes, 50 millivolt shunts are used with the recorder. The strip chart on the recorder may be set to move at 5, 25 or 125 millimeters per second. In addition to the above instruments for use mainly at low temperatures, there is an assortment of ac and dc voltmeters, and ammeters, electrical timers, manometers, battery chargers and hydrometers, available for use. None of the described instruments may be placed inside the cold room at extremely low temperatures. They are used at room temperatures of approximately $+70^{\circ}\text{F}$ to measure characteristics which occur at the lower temperatures.

To conduct both military and commercial testing, Perfection has 18 engineers actively engaged in low temperature investigation, research and development, some of these engineers having experience in winterization dating back to 1940. These men have experience in starting gasoline and diesel engines at -65°F , and in the problems associated with such projects, experience in cab and cargo heating, etc. Eight technicians with low-temperature experience stand by to lend their assistance, whenever needed.

Out of this research in winterization by Perfection has come a series of heaters which fulfill all of the various military requirements for quick starting and continuous operation in extreme cold. Such heating equipment is classified according to use as



An Oliver commercial tractor with Willard battery after leaving the Perfection cold room.

follows: 1. Starting aids for power plants. 2. Heat supply to engines and other vehicle components to maintain efficient operating temperatures. 3. Heat supply for portable equipment in vehicles or trailers. 4. Heat supply for vehicle passengers, operating personnel and transport cargoes. 5. Defrosting, de-icing, etc.

It was in 1941 that a program was initiated by the military authorities in conjunction with the Society of Automotive Engineers at the laboratories of the Texas Company at Beacon, N.Y., to determine the basic needs for low temperature operation of vehicles. Since then, field tests in the Arctic and cold room tests on all types of equipment have established definite requirements which must be met if satisfactory performance is to be obtained.

Much equipment transported by vehicle or trailer must be kept at temperatures above freezing. Personnel must be warm enough to prevent extreme discomfort when sitting still for long periods. Sufficient heat must be supplied to keep windshields free from frost. Power plants must have enough heat furnished prior to starting to allow them to get under way promptly and without undue wear on bearing surfaces, and to warm them to efficient operating temperatures in a reasonable length of time after starting.

Power plant heating must be provided for most equipment whenever temperatures below -20°F are encountered. While it is true that in laboratory

tests under ideal conditions it is possible to start gasoline engines without auxiliary heat in weather as cold as -40°F , practical field tests show that these ideal conditions are seldom if ever achieved, because they require correct fuels, lubricants and cooling solutions, batteries that are fully charged, ignition systems in perfect condition, carburetors in correct adjustment, and well-trained operators. It is almost a certainty that one or more of these conditions will not be fulfilled and, as a result, engines will not start without the aid of an auxiliary heat source.

Tests such as those conducted in the Perfection Cold Laboratory have helped in providing answers to such questions as quick heat vs. standby heat, for starting at low temperatures; the advantages of combined personnel and power plant heating; the amount of heat required to warm a cold engine from -65°F to starting temperature; methods of transmitting heat; and types of heating systems best suited for low temperature areas.

Perfection Industries, Inc. doesn't claim to have all of the answers to cold weather starting and continuous operation of all kinds of land, sea and aircraft. But, day by day and test by test, the company's engineers and technicians are garnering additional information which, should the day come, when America will have to protect its northern frontiers, will make it possible for men and machines to more efficiently operate, no matter how low the mercury drops.



WHAT'S GOING ON IN ENGLAND

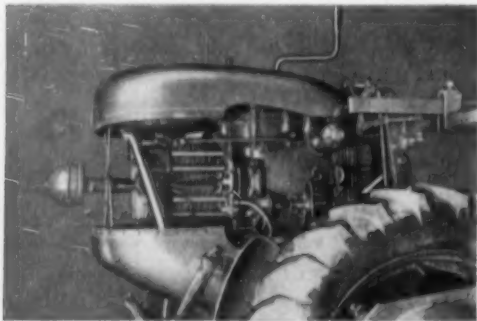
CONDUCTED BY BERNARD W. LANSDOWNE

Bernard W. Lansdowne is an associate member of the Institution of Mechanical Engineers and is widely known among British and European diesel manufacturers as editor of our English contemporary "Gas & Oil Power." His early workshop training was spread over seven years with A.E.C., Ltd., Southall, following which he served some five years with that company's sales engineering department. He entered technical journalism as assistant editor of "Gas & Oil Power" in 1950 and was appointed editor in 1952.

Two New Small Air-Cooled Diesels

AIR-COOLING, particularly for the smaller sizes of engine, is finding increased popularity among British diesel engine designers. The sales of proprietary engines of the types produced by Petters, Enfield, Lister, Armstrong Siddeley and Coventry Victor, have reached very impressive figures, the majority of the equipment to which they are fitted being of the outdoor type—compressors, pumps and the like—where the advantages of air-cooling become more apparent.

Most of the companies mentioned have been associated with air-cooled engine production for many years past and their number has now been supplemented by that of David Brown Tractors (Engineering) Ltd., part of the vast David Brown group of companies, whose products include high speed sports cars, (Aston Martin) gears, tractors, and special machine tools, etc. David Brown announced an entirely new design of air-cooled diesel engine when they introduced their type 2D tractor towards the end of last year. We illustrate this unconventional unit together with a close-up and sectional drawings of its diesel prime mover. It will be noted that a rear mounting position has been chosen for the engine, giving a vastly improved area of vision to the driver and increased adhesion to the driving wheels.



The photo shows the wheeled tractor with the small twin-cylinder engine which carries the same type number as the tractor, namely the 2D. It has a bore of $3\frac{1}{2}$ in. and a stroke of 4 in., giving a swept volume of 77 cu. in. (1,261 cc.); output is 12 bhp at 1,500 rpm. Detachable cast-iron cylinders are fitted to a light alloy crankcase, light alloy also being used for the cylinder heads. The compression ratio is 16 to 1.

Only two bearings of the thin steel-backed copper-lead replaceable type are used to support the crankshaft which is of heat-treated manganese molybdenum. The main bearings are 2.5 in. diameter, 2.2 in. long at the front and 1.97 in. long at the rear. There is a marked degree of bearing overlap between the main and crank pin journals. Of particular interest is the third cylinder-piston assembly of the engine. This is incorporated to counter the inherent out-of-balance forces associated with this type of engine. The piston pumps free air and results in a smooth running engine.



Manganese molybdenum is also used for the connecting rods which carry copper-lead, steel-backed big end bearings. The pistons are of aluminum alloy, injection being direct into the combustion chamber formed in the crown. Two compression rings are fitted together with one oil control ring above the gudgeon pin and one in the skirt. The camshaft is carried in three bearings and is helical gear driven from the crankshaft. It incorporates the fuel injection pump cams and feed pump cams. The overhead valve mechanism follows conventional lines with silicon chrome valves operated by rockers and push rods. Single valve springs are located by split cotters and valve adjustment screws are fitted in the rockers.

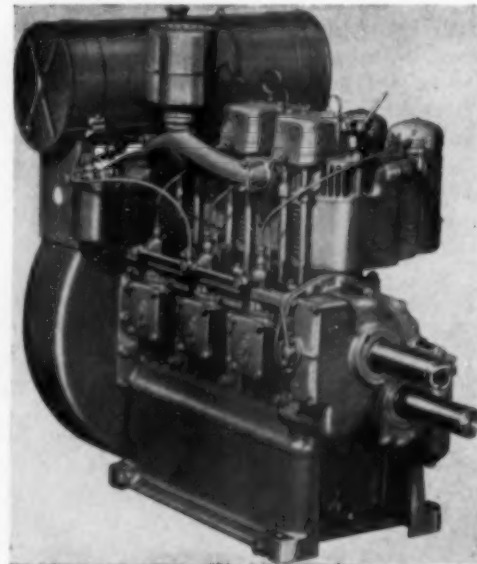
Engine lubrication is provided by a gear pump driven from the crankshaft to supply oil under pressure to the main bearings, camshaft and rocker shaft. The full-flow paper element oil filter incorporated in the circuit is fitted with pressure release and by-pass valves. Engine cooling is by an axial type 10 in. diameter six-bladed fan, Vee-belt driven from the crankshaft, a jockey pulley being provided for belt tension adjustment. In the fuel supply circuit there is a fuel cock fitted on the nearside of the engine, the fuel filter being of the

throw-away type manufactured by Cooper Mechanical Joints Ltd., of Slough. A C.A.V. injection pump is built into the engine and an excess fuel device is fitted to assist starting. For the latter, alternative systems are available, namely hand-starting using a decompressor and inertia starter engaging with the flywheel, or, 12-volt electrical starting as an optional extra.

Other auxiliaries supplied with the engine include a Burgess centrifugal oil bath air cleaner and a single dry plate Borg & Beck clutch.

A feature of particular interest on the tractor is the novel method adopted for driving the implements. Compressed air is used, with a control system derived from a small built-in air compressor, the main frame of the tractor being used as the compressed air reservoir.

Armstrong Siddeley Motors Ltd., also recently introduced a new air-cooled diesel. In this instance, however, it is an addition to an already established and popular range. It is a three-cylinder design



to supplement the company's single and twin-cylinder units. The power range for the new engine is 20 to 33 bhp over its speed range of 1,000 to 1,800 rpm so that Armstrong Siddeley can now offer air-cooled engines covering power requirements from 5 to 33 bhp. A feature of the new

design seen in the illustrations is that the drive may be taken from either end of the crankshaft or from the specially strengthened camshaft, which protrudes from the front cover to give a drive at half engine speed. A range of clutches and a reduction gear are available for use with the engine.

The cylinders have a common bore and stroke of 4.25 in. giving a cubic capacity of just under 3 litres and a maximum piston speed of 1,275 ft. per minute at 1,800 rpm. The bmep at the maximum rated output is 80.3 lbs. per sq. in. The crankcase, cylinders and cylinder heads are all of cast-iron, the latter being suitably finned to provide adequate cooling. The cylinders spigot into the crankcase and the cylinder heads are fitted with renewable valve guides. Engine mounting feet in the form of two longitudinal members are bolted to the crankcase and large inspection doors give free access to the connecting rods and big end bearings.

Fuel is injected from C.A.V. equipment directly into the hemispherical combustion chamber formed in the silicon aluminum alloy piston. The latter carry three compression rings, two oil scraper rings and a fully floating gudgeon pin. The overhead valve gear, push rod-operated from the camshaft, is totally enclosed and pressure lubricated. White-metal lined 2 3/4 in. diameter thin wall bearings carry the steel forged crankshaft, white-metal bearings also being used for the hardened steel camshaft; a starting dog is screwed to the front end of the latter. For the big end bearings of the H-section connecting rods, lead bronze is used for the top half and white-metal for the lower half; a steel-backed phosphor bronze bush is fitted at the small end.

Pressure lubrication is provided by a rotary pump which draws oil through a strainer in the crankcase, delivering it to the main oil gallery after pumping it through a full-flow Tecalemit filter. Oil is fed from the gallery to lubricate the crankshaft, camshaft and connecting rod big end bearings, with an external pipe feeding oil from the camshaft bearings to the rocker gear. Other running parts are splash lubricated from the big end bearings.

Cooling air is delivered from a combined flywheel fan through ducts to the fins on the cylinders and cylinder heads, and special coolers are fitted to the injection nozzle holders situated directly in the air stream. The standard silencer on the engine, which is suitable for industrial purposes, is of the pepper-pot type, but if required, an acoustic type silencer can be supplied at extra cost. The oil washed air cleaner is of Burgess manufacture. A decompressor gear is fitted for use when starting by means of a dog type starting handle operating on the camshaft, but electric starting is available as an extra. A variety of power take-off pulleys can be supplied to suit individual requirements.

New Water Conditioner



The Packard Manufacturing Company, Jacksonville, Florida, announces the marketing of a new

water conditioner that eliminates and prevents scale and corrosion formations in boilers and water systems without the use of chemicals. For use on boilers, air conditioning and refrigerating systems, laundries and other industrial applications where water problems exist; the Packard water conditioner prevents scale and corrosion by imparting added energy to the atoms of the water solution.

Use of the unit, it is claimed, reduces operating costs and increases plant efficiency. Easily installed there is no moving part, no expensive maintenance or servicing either in the form of labor or chemicals. The conditioners carry a ten year warranty. The Packard Water Conditioner is manufactured in sizes handling from 6.5 to 1760 gallons per min-

ute for connection with corresponding standard iron pipe sizes ranging from 3/4 in. to 12 in. Larger sizes are available.

Further information and details may be obtained by writing the Packard Water Conditioner Division, Inc., 2220 West Beaver Street, Jacksonville 9, Florida

ITS NEW

IT'S HERE! NOW AVAILABLE! Bigger, better, completely revised, rewritten and brought up to date. It's Volume 20 of DIESEL ENGINE CATALOG, now ready for mailing. Mail orders are now being filled for this giant reference book with its all-new, profusely illustrated engine and accessory section. Be sure of your copy of this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company form orders to DIESEL PROGRESS, Cole Station, Los Angeles 46, California.

COMPACT DETROIT CONTROL PROTECTS YOUR DIESEL



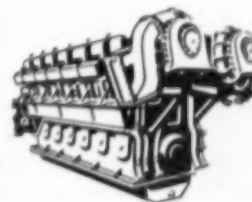
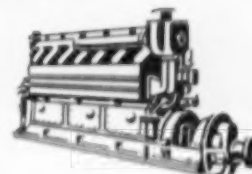
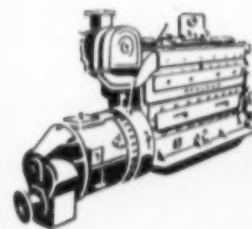
223 Control, cover removed

Detroit 223 Control has wide application in lube oil pressure and temperature alarm systems. It is also used as an automatic engine control switch for emergency shut-down and in other critical functions. This rugged control is only 4 1/8" x 4 1/4" x 2 3/4" and weighs 2 1/2 pounds. The 223 Control is water tight and not affected by conditions of high temperature and high humidity.

This automatic switch is actuated by either pressure or temperature. It can control several circuits, it can actuate a program of safety circuits or it can govern one circuit alone.

Marine, locomotive and stationary diesel engines, pumps, oil drilling engines, mobile compressors and dynamos are only a few applications where Detroit 223 Control safeguards valuable engines and machinery.

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Tampa Tug Repowered



NEWLY painted and with plenty of power below decks, the towboat *Super Test*, owned by the Super Test Oil Co. of Tampa, gave the

appearance of a new vessel both from looks and power performance, according to Capt. David Nice, its skipper. The vessel, built in 1942, is 66 feet in

length with an 18 foot beam and draws 9 foot 6 inches of water, and is of wood construction.

Her new Tandem Twin engine consists of two General Motors 6-110 marine diesels arranged in line and driving a single propeller shaft. With the diesels driving a 14x58 three-blade propeller through a 6:1 GM r&r gear, the towboat makes a speed of 7 mph loaded and 10.5 unloaded as compared to 6 mph and 6.5 mph with her old engines. The *Super Test* operates in Tampa Bay area, but with her increased power and cruising range, her operations can now be extended to the whole west coast of Florida if called upon.

The vessel was repowered by General Engine & Equipment of Tampa, distributors of GM diesels for that area.

Diesels Help Repair Flood Damage



At Cheim airport four Caterpillar D8 tractors with dozers and rippers are moving the earth up to the Thew-Lorrain shovel for loading onto the dump trucks. This material was being hauled to the break in the Marysville levee, torn out when the 5th Street bridge gave way. C. W. Lloyd, local Marysville, Calif., contractor was in charge at this site.

MULTI-MILLION dollar property damage was dealt to Yuba City and Marysville, California, in the recent flood disaster. As usual, heavy earthmoving machinery played an important role in lessening damage as well as providing the means for quick recovery in disaster areas. Weather officials believed the cause of the torrential rains was the shifting of winds from an easterly to a southerly direction. These winds are a jet stream

three miles deep and 400 miles across. This plus the melting snow provided more than the rivers and streams could handle.

The two cities are separated by the Feather River with the Yuba River pouring additional water into the Feather. It was the Feather River which broke the levee on the Yuba City side and inundated the town of 8000 people under 6 to 13 feet of

water. The town of Marysville with 12,500 population was seriously threatened and most of the city evacuated. On the Yuba City side 21 large earth-moving machines worked feverishly to close the 2000 foot break which was about 50 yards wide. This group of equipment included D8 tractors equipped with scrapers and dozers, and three Cat No. 12 motor graders. Five wheel-type tractors provided fill from a greater distance away. Good fill was a problem.

Meanwhile, on the Marysville side work was conducted in all haste to strengthen the weakened position. The washed-out Fifth Street bridge connecting Marysville and Yuba City tore a gaping hole on the Marysville anchorage. Here three Cat D8 tractors were receiving and compacting fill received from 15 Army dump trucks. This fill was being hauled over city streets from Cheim Airport, which is private and not currently used. At Cheim three D8 tractors with rippers and dozers tore up the material for a Thew Lorrain dragline to load onto trucks.

Much of the credit for saving Marysville, which would have been under 18 feet of water if the levee had failed, must go to the personnel of Beale Air Force Base. They sent hundreds of men, supplies, equipment and opened its doors for some 8000 refugees.

"John J. Rowe"



THE *John J. Rowe*, fourth new powerful diesel towboat built for the Ohio River Co. in the past year by St. Louis Shipbuilding Co., is now in

action on inland rivers. With the use of the Kort Nozzles, this new boat has a rated push of 3900 hp. Three Baldwin-Lima-Hamilton Model 606-Sc 6-

cylinder, supercharged 12 $\frac{3}{4}$ x15 $\frac{1}{2}$, 4-cycle marine diesel engines, each rated 1050 hp at 600 rpm. The four-blade cast steel propellers turn at 238 rpm through Falk Model 12 MB reverse and reduction gears with a 2.516:1 ratio and Airflex clutches.

Two Caterpillar 75-kw, 220-volt ac diesel generator sets provide the electric power for the vessel. The 100 gpm Gould fire pump, driven by a 7 $\frac{1}{2}$ -hp Fairbanks-Morse motor with Cutler Hammer controls, supplies six fire hose outlets. Also driven by a Fairbanks-Morse motor is the Gorman-Rupp bilge pump. A Deming pump provides for transfer of fuel oil between bunker tanks. Two 23.5 cfm Quincy air compressors furnish air for main engine starting, the Airflex clutches and whistle.

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EASTERN DIESEL OBSERVATIONS

A COMMENTARY BY ARNOLD B. NEWELL

Arnold B. Newell, a third generation American, was born near Seattle, Washington of pioneer stock. He obtained his engineer's license at 21. Sailed as chief engineer on one of the first ocean-going motorships built in the U.S.A. In 1924 he joined New York Shipbuilding Company in diesel advisory capacity, tested and took to sea New York-Werkspoor diesels, supervised operation of shipyard owned vessels, then in 1927 joined Ingersoll-Rand as diesel field engineer. Became associated with "Motorship" in 1929. Subsequently became managing editor of "Motorship" and "Diesel Power," then vice-president and general manager.

Some Thoughts and Comments on Viewing The Boat Show

THE National Motor Boat Show held annually in New York, formerly at the Grand Central Palace and now in the Kingsbridge Armory is a general marine attraction of the highest order. Diesels have been exhibited at this show for more than a quarter of a century and in fact there has never been another marine exposition displaying more diesels, nor for that matter with a more universal appeal to yachtsmen and commercial vessel owners alike.

While we may justifiably wax enthusiastic over the rapidly expanding market for diesel engines in pleasure craft, a counter element of great importance is the fleets of deep sea fishing vessels on both coasts which have fallen upon evil days. On the Pacific Coast the Tacoma Shipyard Association is employing paid advertising to focus attention upon a deplorable situation. Our government let down the bars and fish imports have idled our fleets. In a region of thriving tuna clipper building a few years ago we witness only four U.S. clippers built in two years.

Uncle Sam's solicitude for the well being of our vanquished foes and friendly nations as well may have been justified to some extent while they were still hungry. Time may prove the folly of so doing. Being neither seer nor judge we do not know what may come to pass and we may not, therefore, prejudge other nations. Surely they are not now in need of help. If they were in need, why should this government of ours select the fishing industry as the scapegoat and thereby idle our great fleets, close down shipyards so vital to national defense, impose undue burden upon the diesel industry and aid foreign operators to sell fish so cheaply as to throw our vessel owners into bankruptcy and drive the fishermen into other fields of endeavor.

The shipyards and the fishermen are in a far worse predicament than the diesel engine manufacturers. They are tied to one locality and dependent upon one kind of maritime enterprise. They cannot shrug their shoulders and decide to go elsewhere when matters get out of hand. It is a case of root hog or die right where they are located.

The tuna fisheries have thus far taken the brunt

of the trouble. Now when and where will the trouble break out again? Could it be that our own salmon will be sold to us by foreign fishermen noted for their sly poaching activities in the past? Will we be buying cheap imported halibut taken off our coast during the presently protected spawning season? May we expect to see crab meat glutting the market at low prices because of cheap labor operation of foreign boats? Will imported herring, sardine, shrimp, cod and all other fresh, frozen and canned fish kill an industry upon which we may have to depend if another war should strike?

Does anyone believe that this is a regional problem? If so he is mistaken, for the fishing industry buys from every state in the Union and supplies food to all of our people. Diesel and shipbuilding and allied industries stand to lose greatly, but the national loss is infinitely worse if every one concerned should fail to demand immediate action by the Congress and the Administration to put a stop to this foolhardy self-destruction.

There is constant fear of saturation building and decline of market. Not long ago that fear cropped up along the rivers. Oil companies had been the best customers of shipyards and diesel makers, when pipe lines threatened to take over the movement of petroleum products. But there was no decline. More and more towboats and barges have been required for bulk cargo movement on the rivers. Now we find that the techniques employed on the Mississippi and its tributaries are taking root on the Magdalena, sometimes called the "Mississippi of South America," and on the rivers of Argentina.

And we witness the mid-continent techniques being applied in such deep-draft strongholds as the Delaware and the Chesapeake. Push boats, of all things! There has been a little of this sort of navigation tried on Long Island Sound, and it should not be surprising to find eastern congestion on land being relieved by the use of the highly successful types of boats used on the Ohio-Mississippi and other inland water ways.

SEEN AT THE SHOW

The two largest yachts shown were twin-screw diesels. One is a 61-footer built by Wheeler and

powered by a pair of Detroit GM 6-110 diesels rated 300 hp each. The runner-up is the Feadship yacht *Columbia*, built in Holland with American made equipment. A pair of GM 6-71 diesels power this beauty with a combined yacht rating of 450 hp.

The most impressive engine display, with the possible exception of outboard motor exhibitors, was the one put on by the Detroit Diesel Engine Division of General Motors having some of the Powerama motif and very definitely in the corporation's style and manner, both lavish and appealing.

In point of complete newness of diesel design the V-8 exhibited by the White Diesel Division of the White Motor Company. The significant name change was Buda to Allis-Chalmers.

In the group of engine exhibitors there are some who have been designers and builders of relatively small numbers of diesel engines. In talking with them we find unanimous agreement that the basic engine now must be of mass production in order to meet competition.

Allis-Chalmers, Buda Division had two propulsion engines and their 7½ kw diesel driven generator set in an attractive booth with a distinctive color tone on the order of the engine buff common to most steamboat engines in the days of steam. The largest engine was the 8DAT-1125. This is a turbocharged job, 5½ x 6½ bore and stroke with a work boat rating of 225 shp @ 1600 rpm and 300 hp at 1900 for lighter boats. It is equipped with Snow-Nabstedt reverse and reduction gear. The 6DASM 844 is a supercharged unit of 6 cylinders shown with the new Twin-Disc reverse-reduction gear and a front-end power take-off. For commercial boats its rated power is 200 hp @ 1800 rpm.

Brush Aboe's display of Petter diesels included a 3-kw 32 volt dc generator driven by a 6 hp water cooled engine, a model PAZ-1 air cooled engine direct connected to a self priming centrifugal pump, a model AVA-1-M of 5 hp at 1500 rpm equipped with Parsons reverse gear for propulsion service, and finally a 2-cylinder AV-2-M with reverse and reduction gear driving a 3-blade 17 x 15 inch bronze prop for small work boat service.

In addition to the regular line of 6-71, series 6-110 and the 4-51 valveless diesels manufactured by the Detroit Diesel Engine Division of General Motors, the popular pair of inclined models 6-71 were shown and there was one new engine. This is a light weight unit weighing under 10 lb. per hp, of 6-71 type in which liberal use of aluminum alloy is found.

A Hercules supercharged DIX6ES rated 150 hp at 3000 rpm was displayed with heat exchanger for cooling and 2:1 reduction gear for a total weight of 1550 lb. Without reduction gear the weight is 1490 lb. The other engine exhibited was a DIX6E rated 115 hp at 3000 rpm and weighing 1380 lb. Both of these models are equipped with Paragon reverse gears. They are available with either Roosa-Master or American Bosch fuel injection and with either heat exchanger or keel cooling systems.

The P & H diesels shown by Harnischfeger consisted of their usually attractive display of the marine models 6-87 C18 and 4-87-C 18. The removable cylinder, piston and connecting rod assembly were again demonstrated to the public.

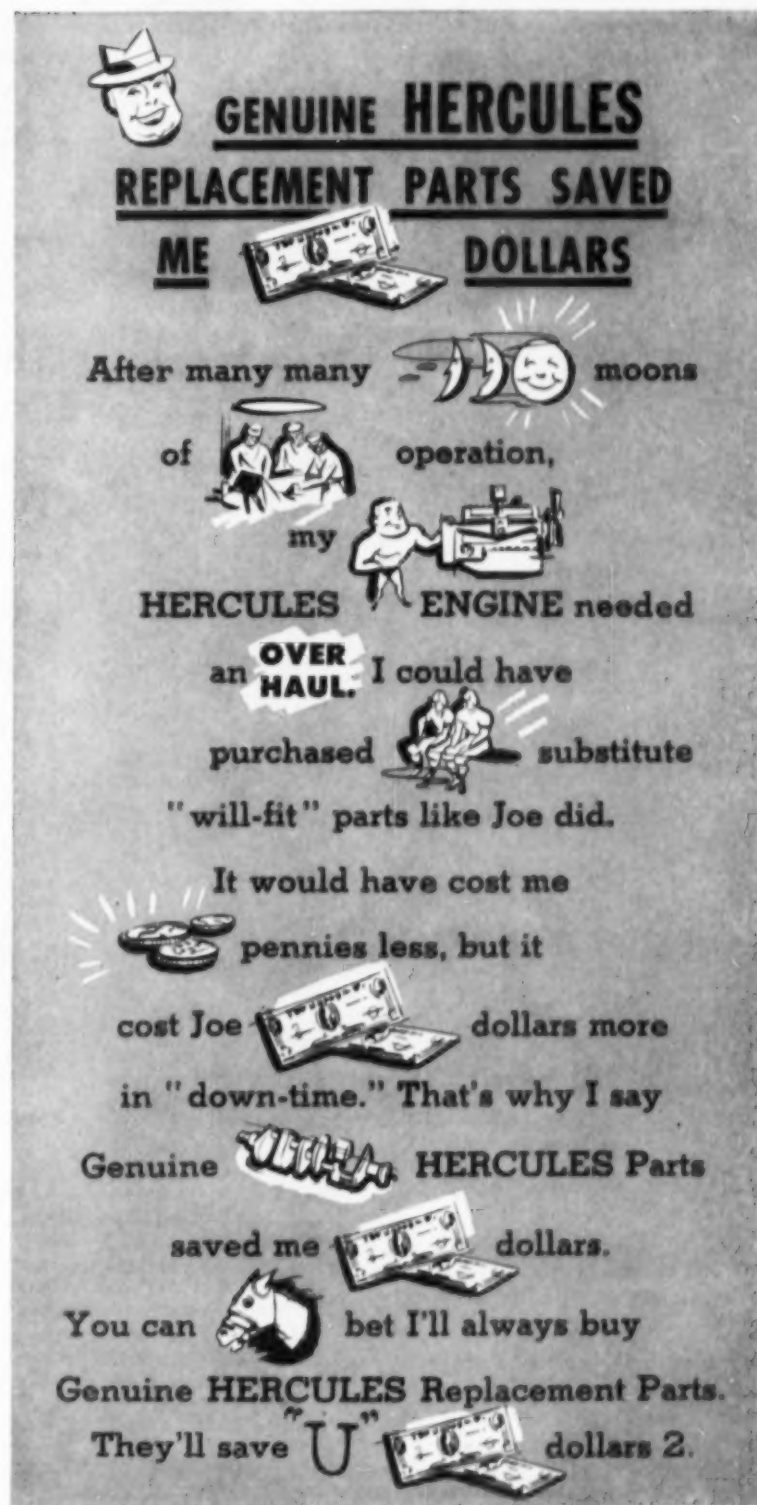
The usually impressive Graymarine setup placed their diesels out in sharp relief against an impressive background of gasoline motors. These engines follow the most advanced automotive practice in design and manufacture. The line includes the 6-D427 rated 100 hp at 2200 rpm and the 6-D572 of 135 hp at 2200 rpm. American Bosch fuel injection equipment and Snow-Nabstedt transmissions are featured accessories.


And finally the new V-type White Diesel was alone in the White Diesel Engine Division's booth. This engine has been so recently described as to require no further reference to its design. However, it is significant that it is in sharp contrast to the forerunner of Atlas-Imperial and Superior types. As a matter of fact there is little "family resemblance," the advantages and disadvantages of which time will tell. The fact remains, this new V-type diesel is modern to the extreme and in our thinking will find a prominent place in the marine field.




MARINE ACCESSORIES DISPLAY



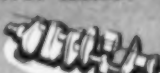

The relationship between yachting and commercial boat operation was not reflected to any pronounced extent in the Boat Show where we used to go for demonstrations of everything from monumental engines to electronic aids to navigation. In some instances, exhibitors leaned heavily to the commercial boat's type of equipment. This year the two most prominent makers of reverse and reduction gearing had new offerings. Twin Disc displayed their new compact gear set and the torque converter which might be employed with conspicuous success on trawl winch or towing machine applications.



Snow & Nabstedt contented themselves with the display of their conventional line plus a brand new pneumatic control system including master control lever to be mounted in pilothouse or any other convenient spot on the bridge or after end of the cabin of a tug. Gold predominated in the decorative scheme symbolizing the 50th Anniversary.



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Straws in Today's Business News

THE OUTLOOK for 1956 continues to be bright in the diesel field despite weak spots elsewhere. Harnischfeger P&H Corporation, in their annual report for 1955 showed earnings equalling \$2.02 per share of common outstanding. Walter Harnischfeger, president, said,

"Net sales . . . were second highest in the history of the company and the company's backlog of orders increased." The firm manufactures cranes, hoists, shovels, engines, etc. . . . The multi-billion dollar automatic controls industry is on the threshold of the brightest year it has ever known, according to a report from Minneapolis-Honeywell . . . Another record year in 1956 ap-

pears to be certain for the manufacturers of heavy-duty over-the-highway trucks and tractors, in the words of Robert F. Black, president, White Motor Company. He added that if the present substantial backlog of White is any criteria, it is quite possible that registrations of heavy-duty vehicles in the 19,501-pound-and-over gross vehicle weights produced by all manufacturers in the

current year will set a new high record in excess of 80,000 units. . . . Estimates of a sustained high level of activity in the petroleum industry and home construction indicate a continuation of the upward trend, is predicted by Rockwell Manufacturing Co.

A NEW FACILITY for the manufacture of Caterpillar crawler tractors in the United Kingdom has been announced by Caterpillar executives. The firm will break ground for a half-million square-foot plant at Glasgow, Scotland. Production of Cat D8 and D4 tractors is expected to begin by 1958. . . . Electric Auto-Lite Company has been awarded a \$214,642 government contract for starting motors for military vehicles. . . . Borg-Warner Corporation has declared a quarterly dividend of 50 cents. . . . Muskegon Piston Ring Co. has signed an agreement to acquire Rotary Seal. Rotary makes a variety of shaft seals for many non-automotive applications.

THE EUCLID DIVISION of General Motors is headed for a major expansion. GM, reports have it, will purchase a more than 20-acre tract outside of Cleveland. Rumored plans are for an office building in addition to warehouses and a gigantic manufacturing facility. . . . Cities Service is planning an outlay in excess of \$750 million in the next five years. . . . Budd Company's railway division expects 1956 sales to exceed 1955 which rose 30%. The new interest in the lightweight railroad passenger cars among railroads will be a contributing factor to the good sales year. . . . New York State is taking steps to submit another large highway bond issue to the voters.

THE PENNSYLVANIA RR is slightly modifying the GM Aerotrain in its own shops to meet its own operating requirements. The new streamliner will go into operation at an early date. . . . American railroads retired more than 1,000 steamers during the past year. Every major Class I railroad in the U.S. now operates or has on order some type of dieselized locomotive. . . . The L & N Railroad will order 50 new diesel locomotives this year to complete the road's dieselization. . . . The Norfolk & Portsmouth Belt Line has received the first of 15 diesels ordered, the beginning of a complete change-over. . . . The Pennsylvania-Reading Seashore Lines has placed an order with Baldwin-Lima-Hamilton for 12 diesel-electric locomotives. . . . The Rock Island's answer to the "piggy-back" problem will be 50 cars which look like abbreviated flat cars, adaptable to container hauling. It will cost about half of what a flat car with tie-down equipment would cost. Different superstructures or "bodies" can

HIGH POWER—LOW WEIGHT

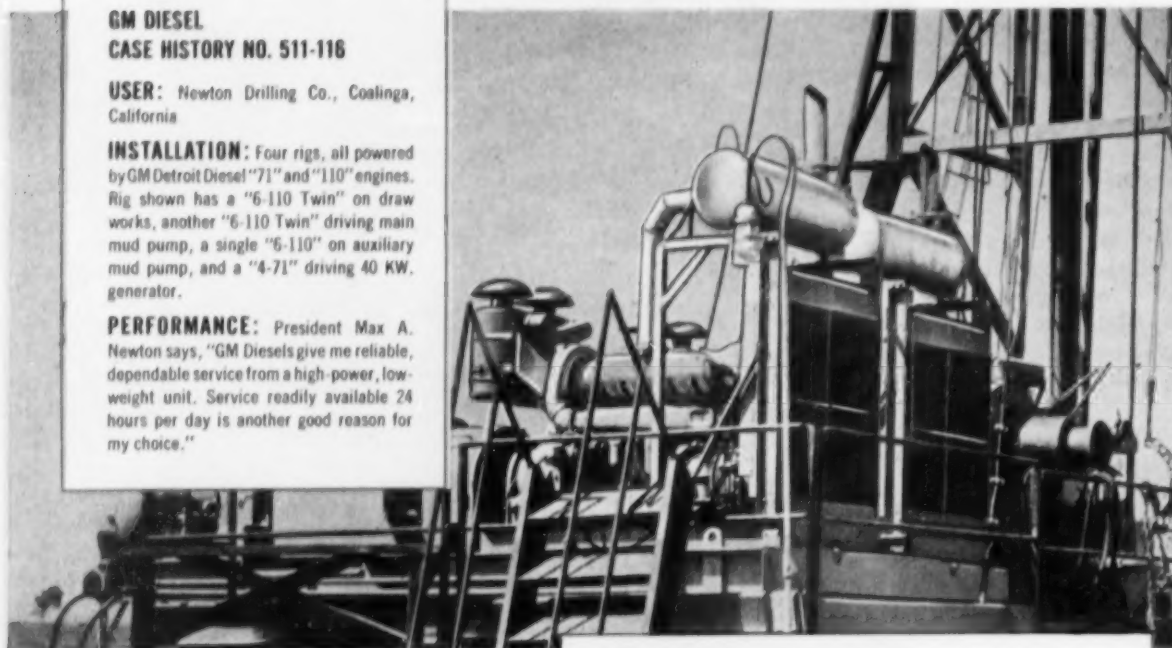
100% Standardized on GM Diesel

GM DIESEL CASE HISTORY NO. 511-116

USER: Newton Drilling Co., Coalinga, California

INSTALLATION: Four rigs, all powered by GM Detroit Diesel "71" and "110" engines. Rig shown has a "6-110 Twin" on draw works, another "6-110 Twin" driving main mud pump, a single "6-110" on auxiliary mud pump, and a "4-71" driving 40 KW generator.

PERFORMANCE: President Max A. Newton says, "GM Diesels give me reliable, dependable service from a high-power, low-weight unit. Service readily available 24 hours per day is another good reason for my choice."



WEIGHS less, costs less, makes hole faster.

This is the story behind the success of General Motors Detroit Diesel engines in drilling. These power-packed, 2-cycle work-horse engines have proved themselves on hundreds of drilling rigs by ringing up performance records that are the talk of the industry.

If you're buying a new rig—or repowering your present one—it will pay you to specify GM Diesel. Both Series 71 and 110 units, available with integral GM torque converters, weigh far less than other Diesels of equal horsepower.

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Single Engines . . . 80 to 300 H.P. Multiple Units . . . Up to 898 H.P.

America's Largest Builder of Diesel Engines

JIMMY DIESEL'S MAINTENANCE TIPS

Preventive maintenance helps you avoid costly breakdowns by spotting small troubles before they get to be big ones. Your GM Detroit Diesel Distributor has this Log Book available. He will help you set up a preventive maintenance program and supply you with factory-engineered parts installed by factory-trained servicemen. Call him today — and remember, Preventive Maintenance Doesn't Cost—It Pays.



DETROIT DIESEL

Engine Division
of General Motors
Detroit 28, Michigan

See Your Local GM Detroit Diesel
Distributor or Dealer.

turn the basic car into a gondola, hopper, tank car or baggage unit. . . . A 1,000 "piggy-back" car pool, a leasing arrangement and interchange agreements among railroads is contributing to the steady growth of "piggy-back" shipments. Volume is growing. Southern Pacific, one of the first roads to institute this type of service, hauled 58,081 loaded trailers in 11½ months ended last December. The Trailer Train Co., offering the leased equipment, will use cars similar to those ordered by the Rock Island.

CONVENTIONS continue to hold the spotlight. The REA Plant Managers Meeting will be held during the first week in April, in St. Louis. A highlight of this annual meet is the Annual Efficiency Award presentation by DIESEL PROGRESS. . . . The Oil and Gas Power Division of ASME meets early in April at the New Orleans' Jung Hotel. . . . The American Welding Society will stage its fourth welding show at Memorial Auditorium in Buffalo, N. Y. . . . At the Associated Equipment Distributors' 1956 Meeting held earlier this year, it was predicted that there will be a boom in construction activity in 1956.

New Type of Return Bend

A new type of return bend has been developed by the Gerry Tool Company in Bristol, Conn. The Gerry Tool Company manufactures a female return bend to accommodate ¼ in. to 1 in. diameter tubes in steps of ¼ in. with an optional cup depth of ⅝ in. to ¼ in. The center to center distance would be ⅞ in. greater than the outside tube diameter the return bend accommodates.

An extremely tight return bend, it is used to advantage by manufacturers of domestic hot water heating equipment, air conditioning units, refrigeration units, and heat exchangers. The Gerry female return bend permits more tubes to be accommodated in a small opening than can be by using the regular long return bend. It also represents a savings in material to the maker. **ITS NEW**

Booklet Available

"How torque converters on shovels increase efficiency" is told in absorbing story form, complete with charts and on-the-job photographs, in the latest issue of Production Road magazine. The publication has just been released by the Twin Disc Clutch Company, Racine, Wisconsin—leading manufacturer of friction and fluid drives for powered industrial equipment. The magazine also gives timely tips on efficient power transmission to all powered equipment users. A copy is available without cost. Simply

write to Production Road, Twin Disc Clutch Company, Racine, Wisconsin.

Names Sales Representatives

Flex-O-Tube Division of Meridan Corporation, of Inkster, Mich., has appointed an East Coast district sales representative and a Midwestern district sales representative for the company's full line

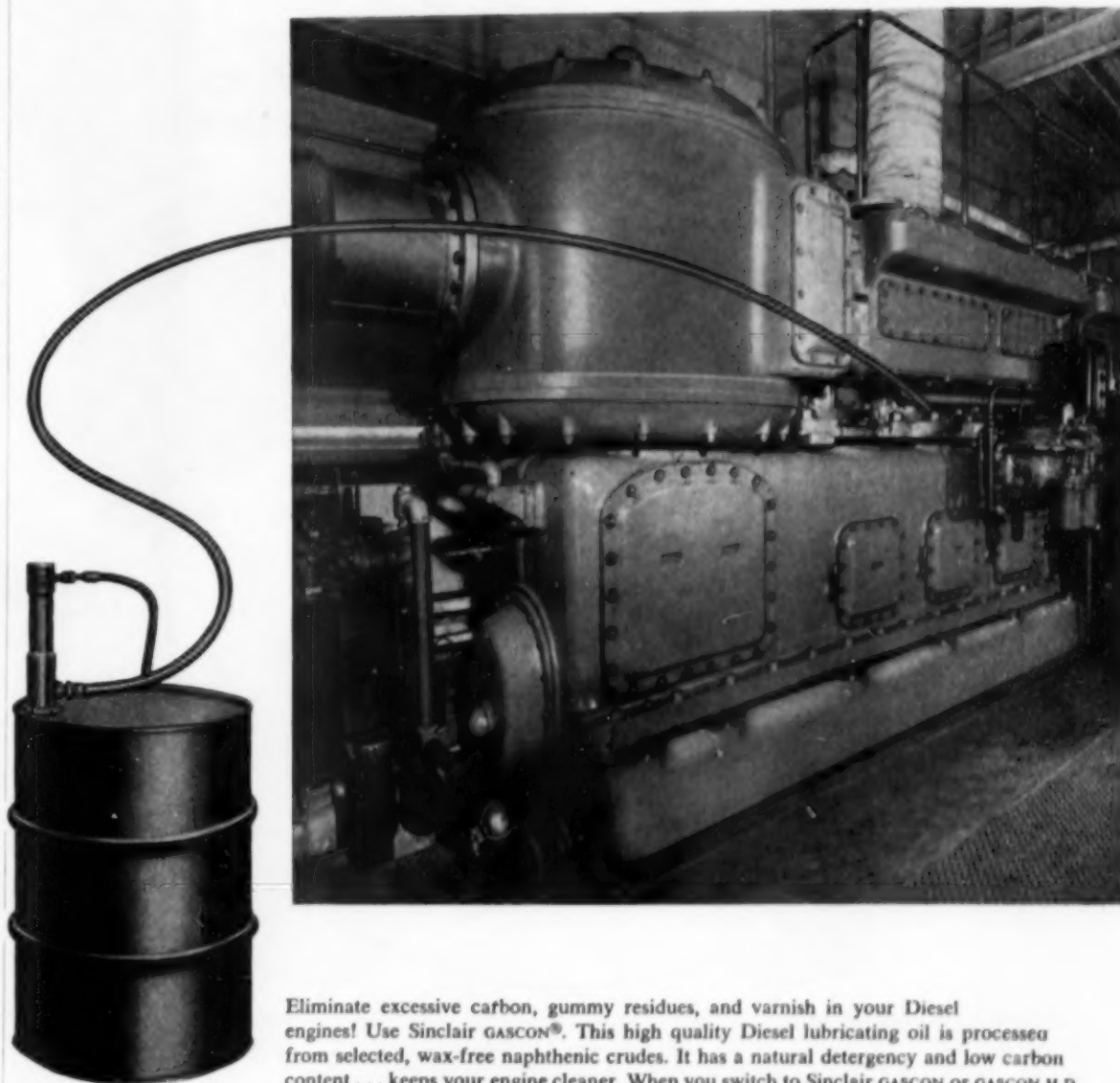
of flexible hose assemblies and fittings, it was announced by Mel E. Maurer, Flex-O-Tube president.

Chester L. McCormick, of Millburn, N. J., formerly a sales representative for the Weatherhead Company of Cleveland and former sales manager for the Uland Rubber Company in Louisville, has been named to supervise sales in Massachu-

setts, Rhode Island, Connecticut, New York, New Jersey, Dela. and Maryland.

Charles K. Stiles, of Evergreen Park, Ill., formerly a sales engineer for Marshall Steel Company, of LaGrange, Ill., and a mechanical engineering graduate of Purdue University, will be responsible for sales activities in northern Illinois, Wisconsin, Minnesota, Iowa, and Nebraska.

Check Carbon!



Eliminate excessive carbon, gummy residues, and varnish in your Diesel engines! Use Sinclair GASCON®. This high quality Diesel lubricating oil is processed from selected, wax-free naphthenic crudes. It has a natural detergency and low carbon content . . . keeps your engine cleaner. When you switch to Sinclair GASCON or GASCON H.D., you know that pistons, rings, valves and exhaust ports stay free from carbon, gums and varnish.

No matter what design of engine you're operating, you'll be 'way ahead with Sinclair's complete line of Diesel lubricants. Contact your local Sinclair Representative now for full details, or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR GASCON OILS

Gulf Coast Diesel Notes

By Michael T. Pate

JOHN W. MECOM, oil producer of Houston, will power four twin-screw combination crew and tugboats now under construction with four pairs of General Motors series 110, model 62203

diesel marine propulsion units, each diesel driving through a 3.75:1 hydraulic reversing and reduction gear. Stewart & Stevenson Services, Inc., of Houston, also furnished four S. & S. model 2GD20 a.c. generating sets as lighting and auxiliary power for these four craft, each unit powered by a heat-exchanger equipped General Motors series 71, model 2061-A diesel.

HOUSTON OIL FIELD Material Company, Houston, has brought from Mustang Tractor & Equipment Company, Houston, a model D-311 Caterpillar diesel. The 45 hp diesel will be used as prime mover on a power swivel.

C. G. GLASSCOCK Drilling Company, Corpus Christi, Texas, has secured from Stewart & Stevenson Services, Inc., of

Houston, a General Motors series 110, twin-6 model 122403 500 hp diesel to power a mud pump on one of its rigs.

STANDARD OIL COMPANY of Texas, Houston, has obtained from Buda Engine & Equipment Company, Inc., two model BD-77 Buda diesels, to furnish power and automatic standby power for an automatic warning signal to be placed on one of the company's offshore oil producing platforms. The diesels were installed on the fog signals by Automatic Power, Inc., of Dallas.

OKLAHOMA FRACTURING Company, Cushing, Oklahoma, has bought from Stewart & Stevenson Services, Inc., four General Motors series 110, model 62403 diesels, each rated at 250 hp. Stewart & Stevenson unitized these diesels in pairs to power two sand-fracturing units.

BIG CHIEF Drilling Company, Morgan City, Louisiana, has taken delivery from Waukesha Sales & Service, Inc., Houston, of two model 6MKDU Waukesha diesels, each connected to a 125 kw. ac generating set. They will be used to power an oilfield drilling rig.

H. L. WOLF, Brownsville, Texas, has taken delivery of a series 71, model 6071-A General Motors diesel from Stewart & Stevenson Services, Inc., Houston. The diesel will be equipped with a 4.5:1 hydraulic reversing and reduction gear for marine service.

COLUMBIA DRILLING Company, Houston, has bought from Houston Engine & Pump Company, Houston, two model 124 Murphy oilfield diesels rated at 225 hp continuous when turning up 1200 rpm. They will replace engines on the company's U-15 Unit rig. They also bought two ME-66 Murphy diesels, rebuilt. These will power a series 450 Alamo compound. A third rebuilt ME-66 Murphy diesel will drive a coring reel on this same oilfield drilling rig.

ROBERT H. RAY Company, Houston, has bought a Stewart & Stevenson model 2GD20 20 kw. ac generating set, powered by a General Motors series 71, model 2030-C diesel. The unit is mounted on a two-wheeled, rubber-tired trailer.

HUNT TOOL COMPANY, Houston, has secured from Big 3 Welding Equipment Company, Houston, a 300 amp. Lincoln welding generator set, powered by a series 71, model 2055 General Motors diesel.

MAHEW MACHINERY COMPANY, Dallas, will power one of the company's Mahew rigs with a series 71, model 4031-C General Motors diesel, rated at 80 hp.

District Representatives and Service Agencies of both companies are available to all customers. Our combined engineering facilities are at your disposal for all problems of governing and control.

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DIVISIONS OF

CURTISS-WRIGHT CORPORATION

The diesel was furnished by Stewart & Stevenson Services, Inc., of Houston.

AUTOMATIC CONTROLS, INC., Houston, has bought from Waukesha Sales & Service, Inc., Houston, four model 180DLC Waukesha diesels, rated at 38 hp at 2000 rpm. The diesels will be used in pairs as power and automatic standby on offshore warning signals for oil producing platforms in navigable waters of the Gulf of Mexico.

OCEANIC CONSTRUCTORS, Inc., has taken delivery from Stewart & Stevenson a model 3GD30, 30 kw ac generating set, powered by a series 71, model 3030-C General Motors diesel. The set is for service in Guatemala, Central America.

PENROD DRILLING COMPANY, Shreveport, Louisiana, has bought from Big 3 Welding Equipment Company, Houston, a 300 Amp. Lincoln welding generator powered by a series 71, model 2055, 2-cylinder General Motors diesel. The unit has been turned over to Lee Construction Company for shipment to a Penrod overseas operation.

HOUSTON OIL FIELD Material Company, Houston, has bought for its own use a model 135DKU Waukesha diesel delivering 106 hp at 1800 rpm. The diesel was sold by Waukesha Sales & Service, Inc., of Houston.

BROWNING MANUFACTURING Company, San Antonio, Texas, will use a series 71, model 4031-C General Motors diesel to power one of their own make rock busters. The 80 hp diesel was furnished by Stewart & Stevenson Services, Inc., Houston.

TIDELANDS SPECIALTY COMPANY, Houston, has purchased five pairs of model GD157 Continental diesels from Houston Engine & Pump Company. Each pair of diesels will be coupled to as many Quincy model WW-44 water-cooled compressors and used in automatic fog-signal applications on offshore oil producing platforms.

PURE OIL COMPANY, Houston, has bought a series 71, model 2031-C General Motors diesel from Stewart & Stevenson Services, Inc., who are unitizing the diesel on a skid base with a Mission Manufacturing Company 3 x 4R centrifugal pump.

CARDWELL MANUFACTURING Company, Wichita, Kansas, has bought through Stewart & Stevenson Services, Inc., Houston, a series 71, model 4082, torque-converter equipped General Motors diesel which will be used on one of the company's portable drilling rigs.

Heads Tuthill Pump Company

Tuthill Pump Company, Chicago, has announced the election of James G. Tuthill as president, succeeding H. T. Kessler who has retired from active service. Grandson of the founder of the company and son of the late chairman of the board, Mr. Tuthill joined the company in July 1953. After serving in vari-

ous capacities in the organization, he was made vice-president of the company in April of last year.

Before joining the company, Mr. Tuthill was on active duty with the regular army for five years following his graduation from the U.S. Military Academy in 1948, and held the rank of captain when discharged in 1953.

THE BIGGEST BUY OF ITS KIND! Bigger, better, completely revised, rewritten and brought up to date. It's Volume 20 of DIESEL ENGINE CATALOG, a volume without equal. Mail orders are being filled for this giant reference book with its all-new, profusely illustrated engine and accessory sections. Be sure of your copy of this fine edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company form orders to DIESEL PROGRESS, Cole Station, Los Angeles 46, California.

To handle bigger tows faster

CHOTIN PICKS GM TURBOCHARGED

DIESEL POWER

Newest towboat planned with General Motors Turbocharged Diesel power is the "Cypress"—namesake of the first towboat owned by Chotin Towing Company of New Orleans, La. Turbocharging gives a GM Diesel 75% more power with virtually no increase in engine size and a big reduction in weight per horsepower. And horsepower for horsepower, a GM Turbocharged Diesel costs less to install, run and maintain. Whatever your power needs—tugs, tankers, towboats, dredges, cargo ships or any other application—you'll have a better investment if you specify a GM Turbocharged Diesel. Your local Cleveland Diesel Engine Division Representative can give you the facts—or write direct for more information.

"The Cypress" is designed by and being built at the J & S Shipbuilding Corp., Slidell, La.



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Road, Tel.: Honolulu 99-9202
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Tel.: 64-2852
New Orleans, La., 727 Baronne St.
Tel.: Magnolia 6761
New York, N. Y., 10 East 40th Street
Tel.: Murray Hill 5-4372
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Seattle, Wash., 1230 Westlake Ave. N.
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Inland River Reports

By A. D. Burroughs

NAVIGATION on inland rivers has been somewhat slower than usual these past weeks due to the early, lengthy and severe winter weather.

THE BIG FOUR stacker, *Lachlan Mac-*

leay, the new pride of Federal Barge Lines, was using its 3600 hp from GM engines to make a sparkling picture crunching through a glistening ice field in early January.

ANOTHER NOTE to the winter theme was the frequent appearance of the Coast Guard cutter, *Fern*, with ice plow, helping out boats in the ice near Winona,

Minn. This boat is equipped with an 85-ton ice-plow, and gets reliable power from three Fairbanks-Morse engines.

A GOOD DEAL of river interest is centered on the *D. L. Gilland*. Now owned by McGehee Lumber Company, Natchez, Miss., this boat built in 1929, has been equipped with two new D337 Caterpillar engines. Good success from these new

engines was reported for the first trial trip out.

LIN SMITH, an active popular boat on inland waters, has been purchased by the Mississippi Valley Barge Line Company from Charles C. Smith and Co. We saw this boat at Paducah, Kentucky, where we learned the triple-screw vessel will carry the new name, *Cincinnati*. Its rated 3330 hp comes from Cooper-Bessemmer engines.

A GM (Cleveland) diesel engine, Model 12-567, provides the 900 hp for the new *Eleanor*. A single-screw towboat, she measures 90 x 24 x 9 ft. 6 in. and was built by Nashville Bridge Company for Crounse Corporation, Paducah, Ky. This new one is in action on the Tennessee River and in the lower Ohio River for the coal trade.

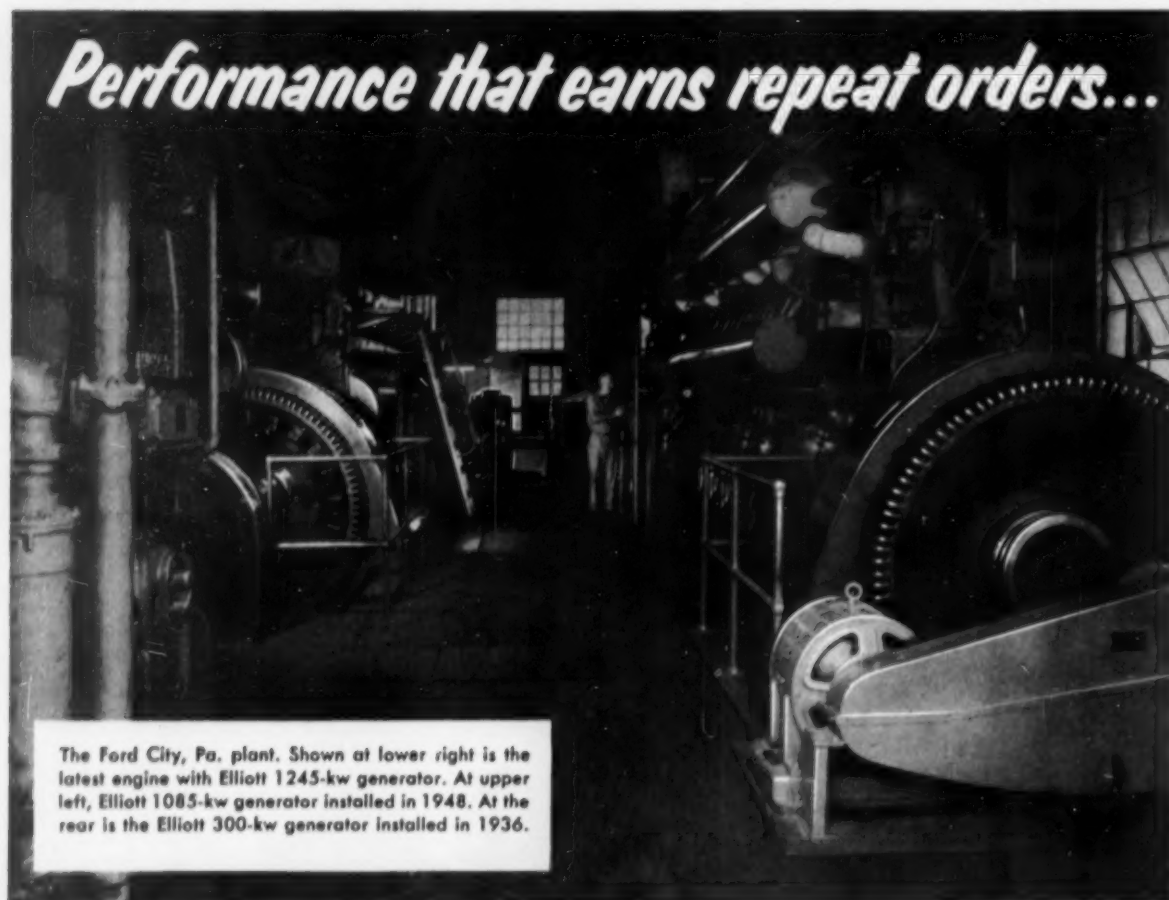
OFFICIALS at the Nashville Bridge Company gave the report that another towboat, a duplicate of the *Eleanor* is set for a March delivery to Crounse Corporation. Also powered with the GM diesel engine, this will carry the well-known names such as Cutler-Hammer, Carlisle and Finch, along with RCA radar equipment.

APACHE is the new name for the *En-Aye*, the Missouri River towboat owned by Western Contracting Corp., Sioux City, Mo., and powered by a Gray marine diesel totalling 450 hp. This craft has the unusual distinction of being constructed in sections by Missouri Valley Steel Co., being tested at Leavenworth, taken apart and transported by truck to Fort Randall, S.D. back in 1951.

OVER ON THE Upper Ohio, the *Sohio State*, with Superior 8 cyl. 12 x 15 diesel providing the rated 1300 hp, has been a frequent visitor on these waters. Built in 1942 at Houston, Texas and named *Edgar C. Johnston*, she is now owned by the Sohio Petroleum Company.

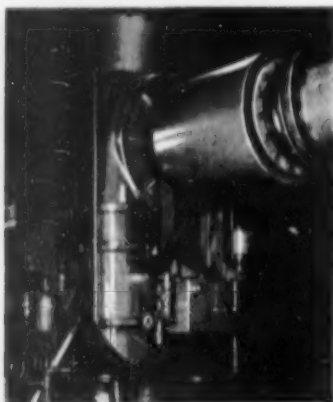
DELTA CITIES, one of the most modern boats on inland waters, is another oft-seen vessel on the Upper Ohio using her 3200 hp Fairbanks-Morse engines in the gasoline trade. This craft, built in 1951 by St. Louis Ship, has quarters with controllable radiant heat, and is designed for a fully integrated operation with a fleet of oil barges up to 1180 feet long. Her owner is the Lake Tankers Corp., N.Y.

AN ENTERPRISE engine, 8 cyl., 12 x 15 turbocharged diesel provides the 800 hp for the *Wesley W.*, now active on the Lower Mississippi River. Built in 1946, at Platzer Boat Works, Houston, this craft was known as the *Walter R.* The present name was given to the boat by the present owners of the craft, Dixie Carriers, in 1950.



The Ford City, Pa. plant. Shown at lower right is the latest engine with Elliott 1245-kw generator. At upper left, Elliott 1085-kw generator installed in 1948. At the rear is the Elliott 300-kw generator installed in 1936.


ELLIOTT Generators and Turbochargers



Close-up of the Elliott turbocharger serving the engine installed in 1954. Another Elliott turbocharger serves engine installed in 1948.

Twenty years ago, the Ford City, Pa. municipal plant installed its first diesel generating unit and an Elliott 300-kw generator went on the job. Since then additional units have been added three times—1941, 1948 and 1954. Each time Elliott generators got the call and in 1948 and 1954, Elliott turbochargers were also included. It's another case of steady, trouble-free performance for Elliott generators and turbochargers. It pays to specify them everytime.

For complete information, consult your local Elliott Field Engineer or write Elliott Company, Jeannette, Pa.

ELLIOTT Company 



UPBOUND on the lower Mississippi was the *Weatherwood*, the neat 90 x 24.5 x 8.8, vessel owned by U.S. Gypsum Company, Greenville, Miss. A Sturgeon Bay Shipbuilding product from 1947, her power is obtained from Atlas Imperial diesel for the rated 800 hp.

NACCO, the twin-screw vessel owned by the Powhatan Mining Company, was seen in the coal trade on the upper Ohio waters. Powered with Superior engines for a total 640 hp, this one has carried a series of names including *Frog*, *Wheeling*, *Corsair* and its present name since its completion at Sturgeon Bay in 1940.

A NOTE of sadness along the waterways came from the burning of the old favorite, *Jane Arden* in late December. Owned by Capt. John Pushak, this long faithful boat had been powered by a 200 hp Fairbanks-Morse diesel.

A NEW towboat has been ordered by the Louisville Engineer District for use in towing equipment on the Green and Kentucky Rivers. Scheduled to be 85 x 26 x 5, constructed of welded steel with a thrust of 9,000 pounds, a speed of 5 mph, the power will be supplied by two diesel engines. Make of engines has not been revealed. Arnold V. Walker Shipyard, entered the low bid of \$182,000.

A LATE PHOTO came in showing the unusual cargo, a massive portable self-elevating "island" for use as a platform for oil drilling equipment. The *Kansas City*, with GM diesels totalling 3000 hp, handled this cargo for the week-long trip down the Mississippi, out through the Gulf, to Galveston, Texas. This strange cargo reportedly weighed 4,000 tons.

A PAIR of 1200 hp Cooper-Bessemer turbocharged after-cooled diesel engines will power the new 2400 hp twin-screw towboat under current construction at St. Louis Shipyard for Cargo Carriers, Inc., Minneapolis. Measuring 150 x 33 ft. 6 inches x 11 ft., June is the present scheduled delivery date. Falk reduction gears along with Kort Nozzles will be a part of the equipment for this new one.

THE *Andrew B.*, measuring 108 ft. x 26 x 6 ft. 3 in., built at St. Louis Ship for the Cumberland River Sand & Gravel Co., was christened in late January at Nashville, Tenn., by the widow of the man for whom the streamlined vessel is named, Mrs. A. B. Crichton. Two Superior engines, Model 40-S2X-8, 8 cyl., supercharged, 8½ in. by 10½ in. engines, each rated at 700 hp at 800 rpm provide the power for this new craft. The 74-in. diameter, four-blade cast steel propellers turn at 256 rpm through Falk special reverse and reduction gears with 2.98:1

ratio. Westinghouse pneumatic controls, Graham heat exchangers, Hilco lube oil purifiers and Ross lube oil coolers are also a part of this vessel's equipment.

Solenoid Valves

Mar Vista Engineering Company in rounding out their in-stock line of solenoid operated pneumatic and hydraulic

valves, announces the Model 40 Series, four way valves. As with their shut-off and three way versions, the four way valves are available for shipment within 24 hours.

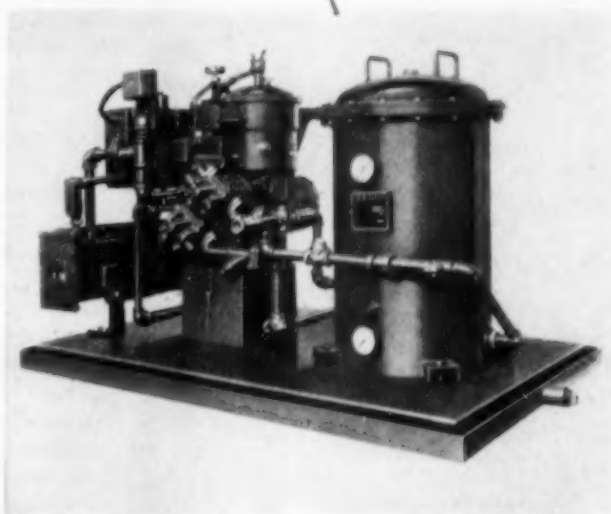
Tube sizes from ¼ to ½ inches are available. Some of the other features are low current drain, continuous duty operation, fast action, explosion proof, oper-

ating range 0-5000 psi, temperature range -65 to +275 degree Fahrenheit and flow rates up to 10 gpm. Folders giving complete specifications are available.

Other new units which they are currently manufacturing include six way hydraulic valves, and solenoid operated stainless steel peroxide and acid valves, among other items.

(ITS NEW)

YOUR DIESEL LUBE OIL + A DE LAVAL "PURI-FILTER" adds up to greater EFFICIENCY...ECONOMY...PROFITS!



Just one machine—the De Laval "Puri-Filter"—can give your diesel lube oil the full treatment!

The "Puri-Filter" keeps oil dry...keeps it clean... removes solid contaminants and gum-forming solids... takes out colloidal carbon and other minute solids down to one micron (0.000039 in.) in size!

And it does all this with one pass...without affecting oil-soluble additives!

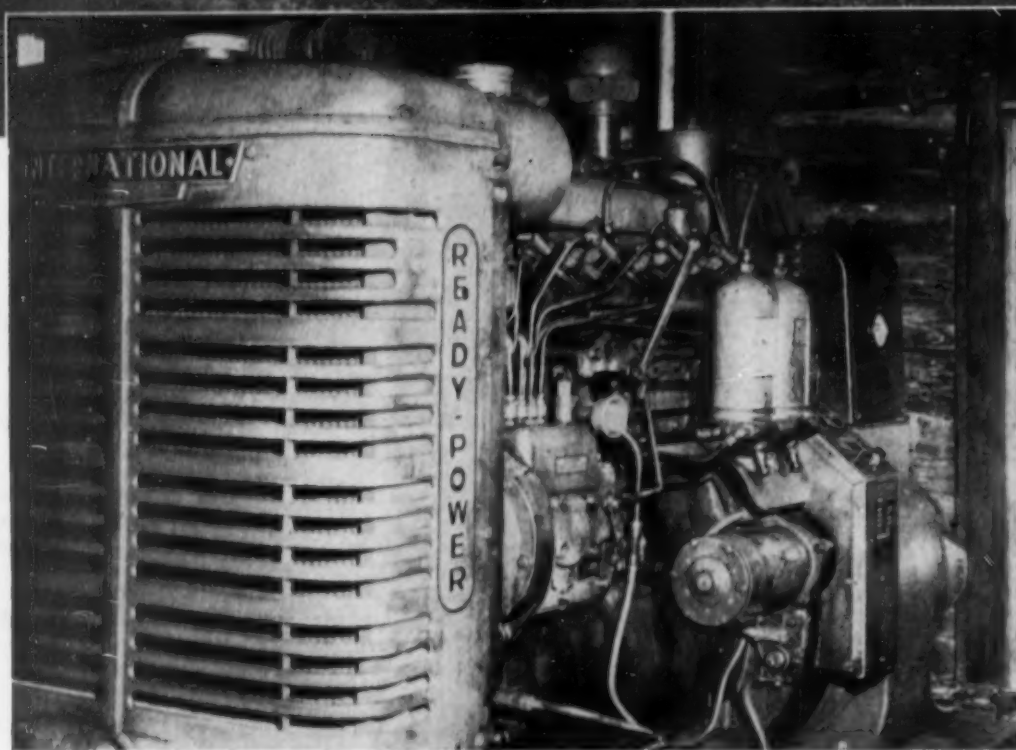
There's more! The De Laval "Puri-Filter" helps prevent ring sticking...prolongs oil life...stretches intervals between ring cleaning...gives you operating economy and efficiency all down the line.

Get all the money-making facts now...write for the "Puri-Filter" Bulletin today!



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PIGEON KEY

By ED DENNIS

ISLA de Las Palomas, the Spanish called this tiny $3\frac{1}{2}$ acre speck of coral, after its feathered inhabitants. Later it was renamed Pigeon Key. Washed by the waters of the Atlantic and the Gulf of Mexico and tied by ribbons of steel and concrete that form the Overseas Highway, Pigeon Key is miles from the nearest electric power lines.

Flocks of pigeons ruled the key until the early part of the 20th century when Henry M. Flagler pushed the Florida East Coast Railroad south, spanning water and coral to connect these tiny keys with the Florida mainland and Pigeon Key became a railroad construction camp and was noted as the smallest inhabited island then known. After the hurri-

Pigeon Key, a $3\frac{1}{2}$ acre tropical key, miles from the nearest electrical power line, and in the hurricane belt, depends on two UD9 International diesels for its electrical power.

One of the RD9A12 Ready Power units powered with a UD9 International diesel engine which was supplied by the Florida Georgia Tractor Co. of Miami, Florida.

cane on Labor Day 1935, the remains of the railroad gave way to the Overseas Highway.

During World War II, Pigeon Key made its contribution to the war effort as a rest camp for the fighting GIs and as a Coast Guard Base. After the war, the key became the district headquarters of the Overseas Road and Toll Bridge District and finally the State Road Department took over.

On November 1st, 1949, a model RD9A12 Ready Power 27 kw generating unit was installed to replace one of the old 10 kva sets. This new generating unit powered with a UD9 International diesel engine has a 120-220 volt single phase ac Ready Power generator complete with all safety shutdown instruments. It proved so successful, that on July 1st, 1951 a second unit was installed. Also included is a Delco battery. Lubricating oil and filters are changed each week and the daily fuel consumption is about 25 gallons of the City Service #2 fuel oil.

Cut off from the rest of the world by miles of open water and in the Hurricane Belt, this tiny coral isle can safely depend on its two International diesel generating units for the source of electric power.

Midwest Diesel Notes

By L. H. Houck

ROY RYAN SONS CO., Henderson, Ky., have a new 22-B Bucyrus-Erie drag-line with a GM 3-71 engine, from Brandeis Machinery Co., Evansville, Indiana.

ANNA QUARRIES, Anna, Ill., put a UD-525 International in service from the Paducah office of Brandeis Machinery & Supply Corp.

NEW Pettibone-Mulliken, Speedall 250, high-lift loader with GM diesel with ranges from 1 1/4 cu. yd. to 2 1/2 cu. yd., in three models, is being handled in the Cleveland, Ohio area by Wepco Equipment Co.

DAVIS CONST. CO., Boonville, Mo., has a new D7 Caterpillar with No. 25 cable control and cable bulldozer, delivered by Fabick & Co., Jefferson City, Mo.

AAA Engine & Electric Co., Inc., Kansas City, Kan., has been appointed parts dealer for Waukesha and will carry a full line of Waukesha diesel engine parts.

I. W. WEST, hauler for M. Bruenger & Co., Wichita produce dealers, has placed a 180 hp Autocar in service with a Cummins engine.

W. W. SALES CO., Wichita, Kan., has placed three new diesel trucks in service—an Autocar with 180 hp Cummins and two Whites with the same engines.

CURT EXCAVATING CO., St. Louis, has added to its heavy-duty dirt equipment with an International TD-14 with a Drott loader from the Missouri-Illinois Tractor Co.

COLUMBIA, MO., special road district, has purchased a Caterpillar No. 12 grader with Cat diesel engine from Fabick & Co., Jefferson City, Mo.

BLACKFOOT COAL & LAND CORP., Evansville, has taken delivery on a HHD Hough Payloader with a Hercules diesel DJXH from Brandeis Machinery Co., Evansville.

NOR-VEL CONST. CO., Ferguson, Mo., has added an International TD-18 tractor with a P-25 winch for scraper work. Missouri-Illinois Tractor Co., St. Louis, made the sale.

UNION SERVICE CORP., Columbus, Ohio, is installing a Cummins 175 hp, Model JT-6-B in a GMC truck for general highway hauling. The unit was de-

livered by Cummins Diesel Central Ohio, Inc., Columbus.

MAETZOLD TRANSFER, Hopkins, Minn., has installed a Cummins 175 hp, Model JT-6-B in an IHC truck to be used in general hauling. Cummins Diesel Corp., St. Paul, made the sale.

INTERNATIONAL TD-18 with a P-25 winch was sold to Femmer Excavating & Grading Co., St. Charles, Mo., by Missouri-Illinois Tractor Co., St. Louis.

RICE TRUCKING CO., Hardinburg, Ky., bought a TD-14 International tractor with a Drott loader from Brandeis at Evansville, Inc.

MISSOURI SILICA, Inc., Jefferson City, Mo., is a new mining company developing a new deposit of silica north of the Missouri river. A D4 Caterpillar with Traxcavator using a 75-inch bucket was bought from Fabick & Co., for general service around the new mine.

AN AUTOCAR ready-mix truck owned by Construction Materials Co., Peoria, Ill., has been repowered with a Cummins 125 hp model JN-6-B from Cummins Diesel Sales Corp., Peoria, Ill.

BURD & EVANS, Mayfield, Ky., has bought an International Payscraper 2T-55, one of the new models hauling 15 cu. yds. heaped, from Brandeis, Evansville. The new unit has a Cummins HRB-600.

W. G. DUNCAN Coal Corp., Greenville, Ky., has taken delivery on an International TD-24 tractor with International diesel engine.

A GARDNER-DENVER 600 with a GM 6-71 diesel, has been delivered from the factory to Mary Construction Co., Cape Girardeau, Mo., on its job on the east side of the new Missouri river bridge at St. Charles, Mo., and the new unit will be used to run a pile driver to put H piles in the sub-base for piers.

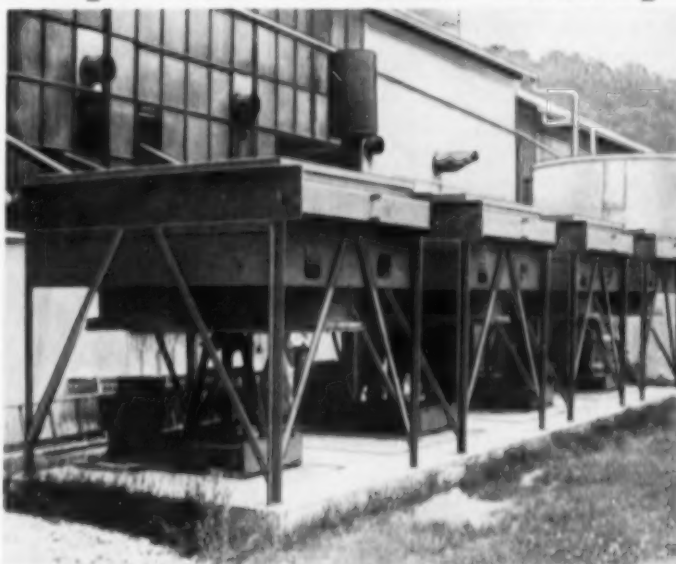
New Bulletin

Publication of a new 12-page, three-color bulletin describing Nordberg Supair-thermal diesel marine engines is announced by Nordberg Manufacturing Co., Milwaukee 1, Wisc. Bulletin 233 describes available drives, dimensions and weights in the four-cycle, in-line engine series together with specification data. A cutaway view through a power cylinder shows the lubrication and cooling water systems. Photographs show tugs, tow boats, fishing craft, dredges, ferries, cargo ships, tankers and fire boats now powered by Nordberg Diesel engines. Bulletin 233 is available free upon request.

(ITS NEW)

Young Engineering Talent

Pays off for Gas Utility*



*South Penn Natural Gas Co. Station, Smithfield, West Va.

Young "HC" Atmospheric Radiators

eliminate cooling
water supply
problems

The Problem: To replace an old cooling tower serving gas compressors. A nearby creek furnished the uncertain water supply.



How Young solved it

Young HC Horizontal Core Cooler and Condenser

Four Young Radiator Company HC Atmospheric Radiators were specified to cool four 165-hp compressor engines. Natural gas is compressed from local field lines and well-head to pressures suitable for shipping to distant sales points. Installation of the Young Units has modernized the compressor cooling system. In addition it has made the utility independent of the uncertain water supply.

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- B. Coils designed for easy access to tube ends.
- C. Coils supplied for any operating pressure.
- D. Steel tanks treated for corrosion resistance.

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Mid-Continent Diesel News

By Jack F. Cozier

BARTLETT ENGINEERING CO., Tulsa, Okla., purchased two Buda 2BD-77 diesel engines to power centrifugal pumps for use in offshore drilling barges from Buda Engine & Equipment Co., Tulsa, Okla.

SOUTHERN PLAZA Motor Freight took delivery on nine DTC-405 Sleeper Cab, westcoast model, International trucks from International Harvester Co., Dallas, Texas. These units are equipped with 180 hp Cummins diesel engines and 10-speed Roadranger transmissions.

STICKLE DRILLING CO., Wichita, Kansas, has ordered two GM model

12103 HD diesel engines from the Diesel Equipment Co., Wichita, Kansas.

H. S. DIEM, Tulsa, Okla., has bought a Chrysler 1ND-30 natural gas engine powering a Marlo 4E3S irrigation pump for work on his Verdigris river farm near Inola, Okla. The sale was made by Diesel Power Co., Tulsa, Okla.

GASO PUMP and Burner Mfg. Co.,

Tulsa, Okla., took delivery on three Buda 8MO-1290 natural gas engines to power Gaso's figure 1753 pumps for sale to a major pipe line company in Southern Louisiana. Delivery was made by Buda Engine & Equipment Co., Tulsa, Oklahoma.

BOSSIER-SHREVEPORT Transportation Co., Bossier City, La., recently repowered two Fitzjohn buses with Cummins JBS-600 diesel engines. Since replacing the old gasoline engines the two 35-passenger buses have almost tripled their mileage figures.

ABC CONSTRUCTION CO., Tulsa, Okla., purchased a Lorain L-26 back hoe powered by a GM 3-71 diesel engine from the Leland Equipment Co., Tulsa, Oklahoma.

TECON CORP., Dallas, Texas, received two model D386 Cat engines with special combination drives to power an asphalt plant. Darr Equipment Co., Dallas, Texas, sold the engines with the feature of the drives being that the operator is to be able to disconnect the mechanical portion and leave the generator power on for the electrical portion.

E. E. LOGAN & SON Construction Co., Muskogee, Okla., bought an S-18 Euclid 18 yard overhung scraper powered by a GM model 6-110 diesel engine. The unit sold by Butler-Sparks Equipment Co., Oklahoma City, Okla., will be used on a state highway job near Oklahoma City, Oklahoma.

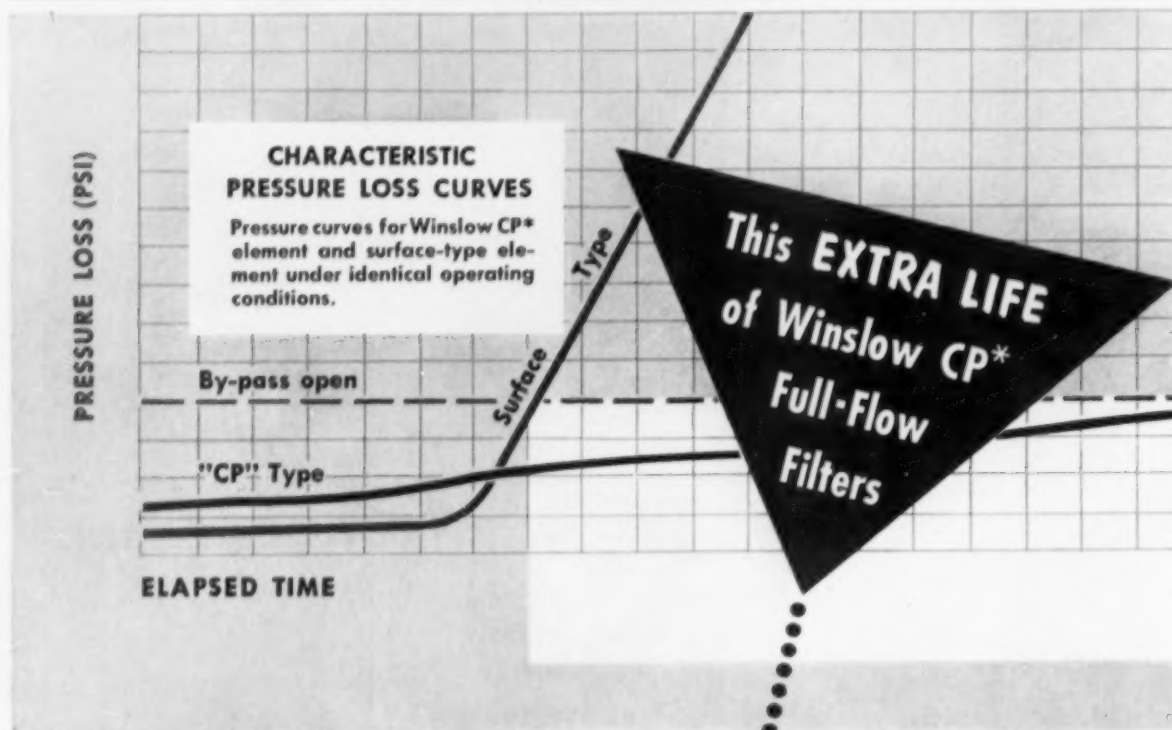
KNIGHT MFG. & SUPPLY CO., Tulsa, Okla., received one Buda 6MO-970 natural gas engine for power for a gas compressor in Illinois from Buda Engine & Equipment Co., Tulsa, Okla.

TUMMELSON EXCAVATING CO., Tulsa, Okla., are repowering a Scoopmobile with a GM 4-51 diesel engine equipped with an Allison Torqmatic transmission from Diesel Power Co., Tulsa, Okla. The unit will be used for general contracting work.

HALLIBURTON OIL Well Cementing Co. Division Office, Oil City, La., have in operation three lowboy trailers powered by Cummins NHR5 diesels and an International truck powered by a Cummins JBS-600 diesel.

DELTA DRILLING CO., Tyler, Texas, purchased a GM diesel engine model 122403, twin 6-110 from the Diesel Equipment Co., Inc., Wichita, Kansas.

SOUTHERN CONSTRUCTION Co., Oklahoma City, Okla., has purchased a Lorain L-26 back hoe powered by a GM 3-71 diesel engine to be used on the

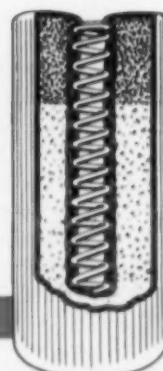


Saves both the Oil and the Engine

Laboratory tests and operating experience indicate that Winslow CP* filters have as much as 50% more useful life than a surface-type filter. As a result, both the lube oil and the engine are protected beyond normal filter service.

Contractors, for instance, report that useful oil life in diesel-powered equipment has been extended from 80 hours to 300 hours, with Winslow CP* filters.

Most important, engines are protected all the time with Winslow full-flow filtration... protected during cold starts, while idling and against excessive dirt... protected if a bearing fails. Because of this better oil filtration, engines last longer and require less maintenance. A modest investment in Winslow filters returns substantial dividends.



THE CP* PRINCIPLE

Winslow patented CP* (Controlled Pressure) elements are designed to continuously self-adjust the pressure within the filter and allow for a full stream of filtered oil from the filter without opening by-pass valves. This is accomplished through the dual flow capacity, with two types of material, as illustrated.

WINSLOW FILTERS

*CP is fully protected by patents and trademarks

W-56-1

Winslow Engineering Company

4069 Hollis Street • Oakland 8, California

turnpike near Vinita. The sale was made by Leland Equipment Co., Tulsa, Okla.

GEORGE E. FAILING CO., Enid, Okla., received a Buda 6DT-317 diesel engine to power a Failing 1500-S rotary rig to be exported. Delivery was made by Buda Engine & Equipment Co., Tulsa, Okla.

DILLON STONE CO., El Dorado, Kansas, has ordered a GM model 4057C diesel engine from Diesel Equipment Co., Wichita, Kansas.

ANDY CARLEGIS, produce hauler, Fort Worth, Texas, operates ten trucks powered by Cummins diesel engines. The fleet includes Federal, International, Mack, Autocar and White trucks powered by nine Cummins HRBB engines and one Cummins NH engine.

CITY OF DYERSBURG, Tennessee, has recently installed a standby gas plant to provide 100% service in the event of failure of natural gas lines providing service to the homes and factories of Dyersburg. The unit consists of two Gardner-Denver model WBJ compressors driven through V-belt drives by Buda 6MO-970 engines.

POWER EQUIPMENT CO., Dodge City, Kansas, dealer under Diesel Equipment Co., Wichita, Kansas, has sold a GM model 3055C diesel engine for a Case farm tractor conversion. The unit will be operating in Northwestern Kansas.

Alco Public Relations Appointments

Alco Products, Inc., has announced a reorganization of its public relations functions. Dana T. Hughes has been appointed director of public relations, reporting to the office of Alco president, Perry T. Egbert. The function of manager of Alco's news bureau will be handled by Roger C. Witherell, who recently joined the company from the editorial staff of the Albany Knickerbocker News. Both Mr. Hughes and Mr. Witherell will be located at Schenectady.

In his new capacity, Mr. Hughes will be responsible for all public relations activities on a company-wide basis. He will assist in preparation of Alco's annual and quarterly reports, together with other corporate and financial material. He also will have overall responsibility for the operation of the company news bureau and will handle various special events concerning new products, facilities and processes.

Before joining Alco earlier this month, Mr. Witherell was City Hall reporter for

the Knickerbocker News. Previously he spent 2½ years as a member of the Albany bureau of The Associated Press. He also is a former telegraph editor of the Salamanca Republican-Press in Salamanca, N.Y.

Australian Caterpillar Plant

The first overseas produced earthmoving

machine to bear the Caterpillar label has come off the assembly lines in Australia. Production of a Caterpillar No. 12 motor grader has been announced by Caterpillar of Australia Pty. Ltd., a recently established subsidiary of Caterpillar Tractor Co. Until completion of a new Caterpillar plant in Melbourne, the equipment is being assembled at Steelweld Pty. Ltd., Braybrook, Victoria.

Ground breaking ceremonies for the new plant are scheduled for the end of the year.

Caterpillar has purchased approximately 100 acres of land in the suburb of Essendon, about 10 miles northeast of the center of Melbourne. Plans and specifications for the first buildings are complete and bids have been invited.

KAHLENBERG CHOSE NAPIER

Napier turbo-blowers fitted to 2-stroke Marine diesel engines are currently increasing power output by at least 30% and even more on industrial applications. Or—if you prefer it this way—with a Napier turbo-blower you can get the same amount of power from a much smaller engine. Specific fuel consumption is no higher and can often be reduced. They are available in seven sizes to suit engines of approximately 140 h.p. to 4,000 h.p. Multiple installations are used for engines of higher powers.



KAHLENBERG BROS. CO., have installed NAPIER Turbo-Blowers on their latest Model E6 Two-stroke, uniflow scavenge Marine Engine.

NAPIER Turbo-blowers

IN USE IN 69 DIFFERENT COUNTRIES

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CRC T7



AUTOMOTIVE DIESEL PROGRESS

A COMMENTARY BY MERRILL C. HORINE

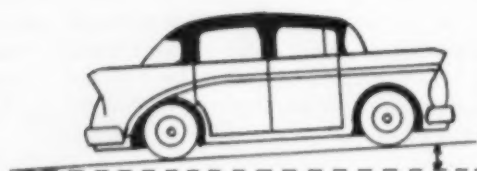
Merrill C. Horine, for 38 years a member of the Society of Automotive Engineers, has been actively engaged in automotive engineering, sales promotion and training, advertising and editing of automotive publications since 1907. He has contributed numerous papers on diesel and allied subjects to the SAE and other organizations. An officer in the Air Service in World War I, he was a consultant to the Chief of Ordnance and the Automotive Division of the War Production Board in World War II.

HORSEPOWER AND PERFORMANCE

IN TRUCK performance, the victory is not always to the strong. That is to say, the vehicle with the highest horsepower rating, given equal gross weight and identical routes, does not always get there first. Since all performance springs primarily from horsepower, this is sometimes baffling. Eliminating such differences in operating circumstances as maintenance, drivers, traffic or terrain, it frequently occurs that a dieselized vehicle with lower rated power than a gasoline-engined one, will demonstrate marked superiority in performance.

Some whose enthusiasm for diesels exceeds their technical understanding declare that this is because diesel horsepower is of a different and special kind. On the face of it, this sounds absurd, like differentiating between the proverbial pound of feathers and the pound of lead. Nevertheless, many experienced long-distance operators declare that the diesel rigs consistently surmount given grades with equal loads, one gearshift speed faster than gas jobs with more powerful engines. They cite the 300-horsepower passenger car engines now being so touted and inquire if these may fairly be compared with the husky 300-horsepower diesels which some of them employ.

Actually there is no reason to doubt that the 1956 passenger car engines can produce their advertised ratings on the dynamometer. But in the car and on the road, it is simply not possible to utilize the horsepower which such engines are capable of. That is why, when they doubled or more than doubled the horsepower of their cars, most manufacturers found it unnecessary to increase the torque capacity of the driving parts. This is because an engine can develop only as much power as is required to balance the load with which it is coupled. At ordinary open-highway cruising



Regardless of the power of its engine, this 4,000-pound passenger car, going 70 miles per hour, up a 6-per cent grade can only use 111 horsepower.



With ideal gear-ratio, the 200-horsepower engine of this tractor-semitrailer combination, grossing 63,000 pounds, with 94 square feet of frontal area, can maintain just 26 miles per hour on a 3 per cent grade. With any other ratio, either faster or slower, its speed would be less.

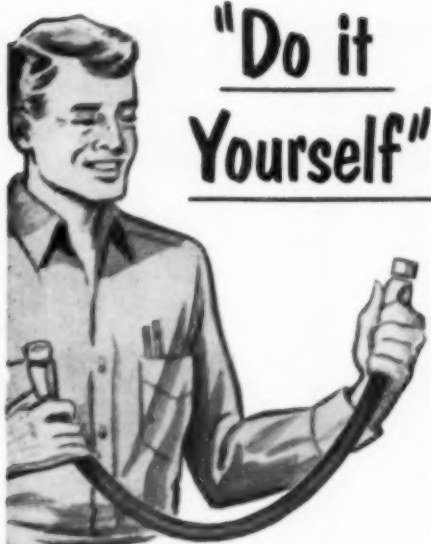
speeds, a modern automobile can use about 45 horsepower. Additional power, of course, is required for greater speed, for acceleration and for steep grades; but under no conceivable highway condition could a 4,000-pound automobile have practical use for as much as 200 horsepower, or for more than a few moments at a time.

No doubt these super-compression, ultra-speed passenger car engines, if properly geared for the job, could duplicate the cruising speed of the big diesels—for a while. Not being designed for service in which wide-open throttle operation for sustained periods is required or possible, their practical-minded designers have naturally not provided them with the margins of endurance, durability and stamina which heavy-duty service requires. So, in such service, one would expect a short, but eventful life.

But that is not all. Perhaps equally significant as the amount of horsepower which an engine produces, is the form in which it is provided. For while a horsepower is always exactly 33,000 foot-pound-minutes, it is possible to have this in many different forms, as noticed in this column for August, 1955. Horsepower is simply the product of torque times speed. A given output, then, may be attained by the combination of high torque at moderate speed or low torque at high speed. And this is precisely why, in so many instances, diesels outperform gasoline powerplants of greater rating. Diesels characteristically produce their power at lower speed; but at higher torque than equivalent gasoline engines.

It is this which permits them to "hang on" in a given ratio on a grade, where a comparable gasoline vehicle must shift to the next slower gear. This gives the driver the impression of greater power; but actually, the slower speed of climb when thus lugging testifies to reduced horsepower. Were a shift made in time, the vehicle would surmount the grade at higher speed and with greatly lessened strain. Another fact which accounts for some of the seeming ability of the lower-powered diesel to outperform the gasoline outfit is the fact that diesels, having a narrower range of operating speeds, often have a greater number of shifts available, with shorter steps between. Skillful driving permits advantage of this to be taken in such a way as to keep the engine speed just under the governor at full accelerator.

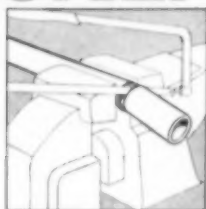
There is no substitute for horsepower; but its efficacy in producing performance depends upon how well its transmission and drive ratios adapt it to the demands of the operation and upon the skill and diligence of the driver in making the most of the equipment.



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STRATOFLEX

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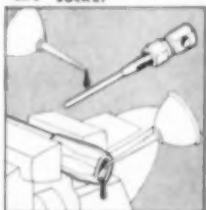
Making up hose assemblies in your own shop or in the field often saves valuable time. The cost of replacing hose lines can be drastically reduced by installing new STRATOFLEX Hose and reusing the detachable fittings. It pays to keep on hand a supply of STRATOFLEX Hose and reusable Fittings. Order from your dealer or write for Bulletin S-2.



1. Cut hose to length



2. Screw on socket



3. Oil inside and insert assembly tool



4. Screw swivel nipple or male fitting into socket and remove tool



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Dial Type Railroad Gauge



The development of a new dial type gauge which permits instant direct reading of railroad tank contents is announced by The Liquidometer Corp., Long Island City, New York. Known as model D6, the new gauge is designed for fuel or water gauging on diesel locomotives, passenger cars and mechanical refrigerator cars. The D6 offers improved reading over sight gauges, where fuel oil stains on the glass obscure accurate indication. Fluorescent dials on the Liquidometer railroad gauge facilitate night readings.

Dial indication on the D6 is effected by float actuation and direct mechanical linkage through a special bellows seal. This seal entirely eliminates fuel and vapor leakage into the dial. Fuel loss and fire hazard are obviated. The gauge, which is calibrated in gallons, can be used to gauge any size or shape fuel or water tank. The gauge float is made of a solid synthetic material and is both water and

fuel proof. The D6's rugged construction eliminates maintenance problems. **ITS NEW**

Joins Clark Bros Co.



Gordon Lefebvre

Gordon Lefebvre, formerly president of the Cooper-Bessemer Corp. of Mt. Vernon, Ohio, has joined Clark Bros. Co., Olean, N.Y., prominent engine, compressor and gas turbine builder. Clark Bros. Co. is a division of Dresser Industries, Inc., Dallas, Tex.

Mr. Lefebvre's position at Clark will be in an executive advisory capacity. He comes to Clark with many years of experience in the automotive and heavy industry field. Among the positions he has held were those of general manager of the Pontiac division plant of General Motors Corp. at Pontiac, Michigan and general manager of the GM plant at Oshawa, Canada. He has also been in charge of all production, inspection and plant construction for the Chevrolet plant at Detroit.

After leaving General Motors, he headed a consulting engineering firm before being named General Manager of the Diesel division of the American Locomotive Corp. at Auburn, N.Y. He left this position in 1941 to join the Cooper-Bessemer Corp. He will make his headquarters at the Clark plant in Olean, N.Y.

**BIG SHIPS—BIG RESPONSIBILITIES
—THEY CAN'T AFFORD TO FEED THEIR
DIESELS . . . A MICKEY FINN!**

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Photo Courtesy of U.S. Dept. of Defense

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76 Pages—275 Illustrations
56 Engine Reference Tables
26 Parts Lists

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- Nozzle Testers for American Bosch, Caterpillar and Bendix Nozzles
- Cummins Injector Tester
- International Harvester Injection Testers
- General Motors Injector Testers
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- Nozzle-Injector Cleaning Tools and Lapping Blocks
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AD-15

Northeastern Diesel Notes

By A. B. Newell

A 60 FT. AUXILIARY ketch has been designed by M. Rosenblatt & Son for Frank H. Wheaton, Jr. Construction will be of wood in the yard of the owner at Milville, N.J. Power will be supplied by a General Motors Model 43200-A with 2:1 reduction through a Walter V Drive.

PLANS OF THE Ingalls Shipbuilding Corporation to build a dieselized freighter of 880 hp to their own account have been held up pending revision in compliance with the requirements of a purchaser of the vessel whose name remains undisclosed.

BIDS HAVE BEEN LET out for construction of an 80 ft. YP training vessel for student training at Annapolis. The power plant, shown on the plans drawn up by M. Rosenblatt & Son of New York City, is made up of two General Motors 6-71 diesels although it is not required that any one make of engine must be included in the bidding.

AN INTERESTING "face lifting" job and repowering of the former 85 ft. cruiser *Framar* is under way at the Merrill-Stevens Shipyard in Jacksonville, Florida. The vessel of John Wells original design has been renamed *Hesperus* and is being refurbished and repowered with a pair of GM 6-110 diesels. The work is to plans and supervision of M. Rosenblatt & Son for Wm. Cherry, Jr., a member of the firm of Cherry & Webb of Providence, R.I. Frank Wheaton sold the boat to Mr. Cherry when he decided to build a new one for himself.

THE USE OF DIESELS in fast open boats has the advantage of almost unlimited running at extremely low cost of fuel and it is therefore not surprising that a GM Detroit Diesel 4-51 has been installed in the 26 ft. *Quickie* for a speed of 21 mph. She is used by her owner, N. C. Hunt of Miami Beach, Florida for utility and fishing service.

THE ONES WHO MISSED the genial presence of George W. Codrington at the Motor Boat Show in New York, and later, will be pleased to know that he is enjoying a vacation in Europe. As to be expected George Codrington traveled on a motorship, the *Kingsholm*.

THERE IS TALK in marine circles that the International Harvester diesel will be equipped for marine service and sold through one of the old time Connecticut makers of heavy duty marine gasoline engines.

AT THE MOTOR BOAT SHOW the

Harnischfeger organization sold a pair of the P & H Diesels, Model 6-87-C 18 to a Florida purchaser for installation in an 83 ft. shrimp to be built. The owner preferred not to have his name disclosed for the time being.

IT IS GENERALLY believed in well informed New England maritime circles that the Hathaway organization of Fairhaven, Mass. is the Number One contender for the marine selling rights to the Waukesha diesel. If this follows the pattern set by the Wolverine Motor Works, the selling agent will equip the engine for marine use.

THE MOREHEAD SHIPBUILDING Corporation's yard at the North Carolina city for which the plant is named recently delivered the *Halibut John*, a 55 ft. standard type of Hatteras trawler driven by a GM 6-71. The owner, John K. Borten is also the skipper. He is better known in fishing circles on both coasts as "Halibut John."

DWIGHT S. SIMPSON, one of the best known naval architects on the Atlantic Coast and a staunch advocate of diesel propulsion for many years has formed his own company known as Dwight S. Simpson & Associates with offices on Commonwealth Pier in South Boston. The associates are Stan Potter and John McArthur.

THE HATHAWAY MACHINERY Company of Fairhaven, Mass., recently repowered 117 ft. dragger *Wawenock* with a 720 hp Baldwin-Lima-Hamilton diesel. The owner is Harvey C. Gamage, a boat builder of South Bristol, Maine operating under his own name.

PAUL BOOTH of Carmel, New York is the proud possessor of a brand new dieselized Badger Machine Co. Hopto combination digger and 3/4 yard front-end loader for use in general construction work. The sale was made by Colonial Tractor & Equipment Company of Wilton, Conn., and Mt. Kisco, N.Y., one of the largest dealers in John Deere equipment. They report active sales in the Deere Model 70, Standard diesel tractor and the big new "80" particulars of which are now available. The engine has a 6 1/2 in. bore and 8 in. stroke for operation at 1125 rpm on load and 1270 on governor, idling. This is a power steering job with a 6-speed transmission and V-4 starting engine.

ISSIS FARMS at Brewster, N.Y., one of the largest and most widely known in the region, is a user of diesel equipment and has just taken delivery on a diesel driven Fordson Major for general farm use. It is worthy of note that all of the Dearborn Implements such as the disc

harrow, wheel type tandem disc harrow, moldboard plow, rear attachment mower and forage harvester are used with the Major and sold by the Stern organization at Bedford Hills.

TYLER-PREUSSER of Pelham Manor, New York, recently sold a pair of 6-wheel graders to Beralta Construction Company of Harrison, N.Y., for use on

the Massachusetts Thruway. Austin-Watson of Aurora, Ill., a division of Baldwin-Lima-Hamilton equips these graders with General Motors 3-71 diesels and Allison torque converters. An important feature is the tail-shaft governor giving required power automatically at all loads. These graders are said to be the only equipment of their kind with power and steering on all six wheels—the 4-wheel bogie also steers.

THE CONDON TREE COMPANY of White Plains, New York, just purchased a Fordson diesel tractor from the H. A. Stern Tractor Company of Bedford Hills Road, Bedford, New York. The Fordson will be used with a loader in connection with Condon's tree "doctoring" business, long established in Westchester and Putnam counties.

POMERO ASSOCIATES INC. of Tuckahoe, New York, recently took delivery on a Fordson "Major" diesel loader and trencher for use in general contracting services. The Major delivers 36.29 hp at draw-bar or 40.58 on the belt. It is equipped with the 4-cycle, 4-cylinder Ford diesel put into production at the Ford plant in Dagenham, England in 1951 following development that started in 1947. Sale of the diesel loader was made by A. J. Vanaria of H. A. Stern in Bedford Hills, New York.

New Ignition Unit

A new ignition system for heavy-duty high compression gas engines used in the petroleum, aluminum production and power plant fields has been brought out by the Scintilla division of Bendix Aviation Corporation. The matched system combines a new type Bendix LC magneto with the company's Hi-V transformer coil. This combination, according to George E. Steiner, divisional general manager, was engineered to meet the exacting requirements of large stationary industrial engines of 6 to 16 cylinders ranging from 1,000 to more than 4,000 horsepower.

"This new system," Mr. Steiner said, "is precisely balanced and delivers more than ample voltage with minimum spark plug erosion. Its features include long service life, reduced maintenance costs, and flame-proof design." He pointed out that adjustment of the master breaker of the LC magneto is normally required only once a year—during major engine overhaul periods. In addition, the LC magneto has a high output at normal cranking speeds and does not require an impulse coupling for starting.

"The unit breaker assembly is easily adjusted," he said, "and operates with minimum wear, due to low current at

the breaker points. Advancing or retarding the spark is accomplished by rotating the entire magneto section, either manually or through a mechanical linkage, and this allows the voltage to remain constant." All shafts of the LC magneto are mounted on sealed ball bearings; its cam material and cam follower material are matched for minimum wear; mechanical and electrical components are designed to withstand severe vibration; and a special design provides dustproof ventilation. Windows in the distributor housing cover and the gear box also permit easy accessibility for servicing of the equipment.

Mr. Steiner also said DLC magneto models are suitable for installation on odd-firing engines and for use with dual-ignition systems with staggered timing.

(ITS NEW)

New Product Literature Directory

A new 9 by 4-inch, 24-page directory of product literature—"This is A-C From A to Z"—has been released by Allis-Chalmers Manufacturing Company. In addition to an alphabetical description of company products and their descriptive literature, the directory has a brief history of Allis-Chalmers as an introduction. It also lists the location of the firm's 17 plants, sales offices and tractor branch houses.

A self-addressed, postage-prepaid post card attached to the inside of the back cover makes it easy to order any desired product literature. Copies of "This is A-C From A to Z," B6057, are available on request from Allis-Chalmers Manufacturing Company, 961 S. 70th Street, Milwaukee, Wis.

Delivers Logging Trucks

Delivery of 10 Kenworth logging trucks to the Weyerhaeuser Timber Company's branch at Longview, Washington, was made in February, it was announced by R. D. O'Brien, vice president in charge of sales for Kenworth Motor Company of Seattle. The Weyerhaeuser order was for Model 523 logging transports to be used both on public highways and private logging roads. The steel-framed custom-built trucks have Cummins NHB 200 horsepower diesel engines and Timken SQDD rear axles with interaxle differentials.

Weyerhaeuser's new Kenworths were ordered through Roberts Motor Company, Kenworth distributor with headquarters at Portland, Oregon.

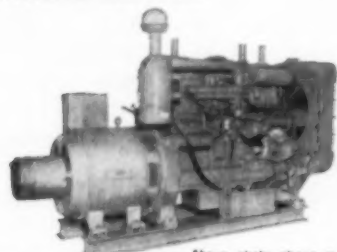
Locomotive for Logging Service

Baldwin-Lima-Hamilton Corp., Phila-

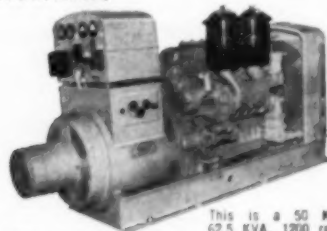
delphia, Pa., has received an order from Rayonier Incorporated, Seattle, Wash., for a Model S-12, 1200 horsepower diesel-electric switcher locomotive. It is to be delivered to the company's Clallam Operation for use in logging service. Equipped with a 6-cylinder supercharged diesel engine, the locomotive will be capable of developing a continuous tractive effort of 46,000 pounds at 7.2 mph.

KATO

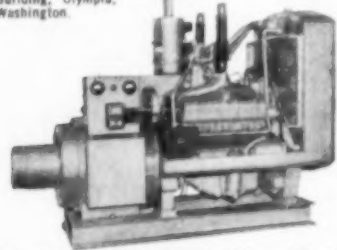
Continuous A.C. Standby Power
GENERATORS
... a size and type to meet your needs to 500 KVA.



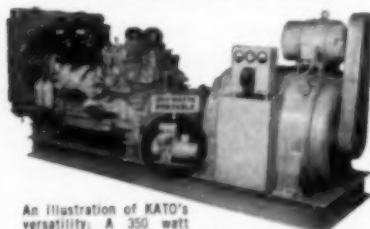
Above photo shows a 50 KW, 62.5 KVA, 1200 rpm, 120/208 volts, 3 phase, 60 cycle KATO Generator and instrument panel, driven by an International Model UD-18A diesel engine, installed for the Mechanical Construction Division in Salt Lick, Kentucky.



This is a 50 KW, 62.5 KVA, 1200 rpm, 120/208 volts, 3 phase, 60 cycle KATO Generator and instrument panel, driven by a General Motors 6030C diesel engine, installed in the State Office Building, Olympia, Washington.



This picture shows a 75 KW, 93.5 KVA, 1800 rpm, 240 volts, 3 phase, 60 cycle KATO Generator and instrument panel, driven by an H-540 LeRoi engine utilizing natural gas for fuel. For Republic Steel Corporation of Gary, Ind.



An illustration of KATO's versatility: A 350 watt KATO Generator driven by a Lauson LMH engine and a 150 KW, 187.5 KVA, 750 rpm, 120/208 volts, 3 phase, 25 cycle KATO Generator and instrument panel—driven by a General Motors twin 6-71 diesel engine. For Duluth, Mesabi & Iron Range Railway.

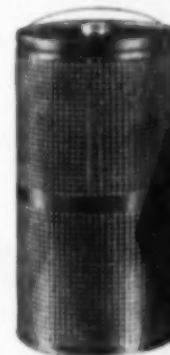
Your inquiries invited.

Builders of Fine Electrical Machinery Since 1928
KATO Engineering Company
1443 First Avenue, Mankato, Minnesota

MARCH 1956

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ENGINEERED PROTECTION



YES! IT'S WHAT'S INSIDE THAT COUNTS

The Efficiency of Luber-Finer's Exclusive Patented Process

HAS NEVER BEEN EQUALLED!

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Only a Luber-Finer Unit Plus a Genuine Luber-Finer Pack can give the Exclusive Patented Filtering Process that has made Luber-Finer The Standard of the Industry Since 1936!!



THERE'S A LUBER-FINER MODEL FOR EVERY TYPE OF ENGINE—EVERY TYPE OF OIL!!

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1. REFINING PACK

Introduced to the public in 1935 for use with straight mineral oils, fuel oils, hydraulic oils, and inhibited industrial oils.

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First made available in 1941, the DIESELPACK was primarily designed for use with H.D. detergent compounded oils and has also achieved outstanding results when used with fuel oils and straight mineral oils.

DON'T BE MISLED BY PRICE ALONE!

There is no substitute for DIESELPACK'S Patented Filtering Process for H.D. Compounded oils AT ANY PRICE!

The DIESELPACK cleans more oil faster—keeps it CLEAN longer—and gives more service and better engineered protection than ANY of the substitute filtering elements being offered for Luber-Finer units.

IT PAYS TO GET THE BEST!

STANDARD OF THE INDUSTRY SINCE 1936

Luber-Finer Units are Standard and Optional Equipment on America's Leading Diesel Trucks, Tractors, Stationary Engines.

Write for Complete Information to Dept. 83

LUBER-FINER, INC.
2514 S. Grand Ave., Los Angeles 7

New Michigan Distributor



M. W. Bever

Clarke F. Andreae

The appointment of Peninsular Diesel, Inc., of Detroit, as distributors for General Motors indus-

trial diesel engines has been announced by Robert E. Hunter, general sales manager of GM's Detroit Diesel Engine Division. Peninsular Diesel, a newly established company, is headed by Clarke F. Andreae as president and M. W. Bever as secretary and treasurer and diesel manager. The company will operate throughout Michigan's lower peninsula with headquarters at 6565 West Warren Avenue in Detroit. A branch is to be established in Grand Rapids.

Mr. Andreae was formerly associated with the Chevrolet Motor Division at Saginaw, the Aluminum Permanent Mold Company of Grand Rapids and the National Container Company of Detroit. Mr. Bever was formerly diesel manager for the Earle Equipment Company of Detroit and prior

to that had twelve years' service with the Detroit Diesel Engine Division. Sales and service facilities have been established at the Detroit headquarters and a dynamometer test room is now under construction. Service manager is Charles Rosso, who has had many years' experience with GM Detroit Diesel engines. Rex Morrison, well known to GM diesel owners in Michigan, is parts manager.

Manager, Marine Sales Division



Joseph H. Moran

Joseph H. Moran has been appointed manager, Marine Sales Division, of The Texas Company's Domestic Sales Department, it was announced recently by S. C. Bartlett, vice president in charge of Domestic Sales. Mr. Moran succeeds the late J. G. van Santvoord. His headquarters will be in New York. Mr. Moran has been assistant manager (Industrial Sales) of Texaco's Southern Territory, with headquarters at Houston, since 1945. He was born in East Radford, Virginia, in 1904, and was graduated with a B.S. degree in 1925 from the Virginia Polytechnic Institute, and two years later he received a degree in Electrical Engineering.

Combines Research and Sales To Speed Up Designs



Because of an increasing demand for service tools and equipment for automobiles, trucks and diesel engines of all kinds, the Kent-Moore Organization, of Detroit, Michigan, is constructing a new \$450,000 building that will house engineers, researchers, executives and sales personnel under one roof.

According to J. Douglas Adair, president of Kent-Moore, "This combined operation will help to speed up the design and release of new tools, provide more factory lead time, and afford better all-around service for our customers."

Working in close cooperation with such major companies as General Motors Corporation, International Harvester Company, American Motors Corporation, Studebaker-Packard Corporation, LeTourneau-Westinghouse Company, Allis-Chalmers Manufacturing Company, Continental Motors Corporation, and many others, Kent-Moore designs, tests and manufactures custom tools that will do special jobs on cars, trucks and a wide variety of dieselized vehicles. These jobs are impossible to do with standard tools.

The new office building will be located on Mound Road, just south of Twelve Mile Road in Warren Township, a suburb of Detroit. The two manufacturing plants of Kent-Moore are in Jackson, Michigan.

The World's Leading Manufacturers of FUEL INJECTION EQUIPMENT for Diesel Engines



Depots and Service Agents in over 100 Countries.

C.A.V. DIVISION OF LUCAS ELECTRICAL SERVICES INC., 653 TENTH AVENUE, NEW YORK, 36, N.Y.

Sales Office: 14820 DETROIT AVENUE, CLEVELAND, 7, OHIO.

AP 174-754

REA 7th Annual Conference

As in past conferences, the Annual REA Managers meeting will be a joint steam and diesel affair. The meeting will be held at the Melbourne Hotel in St. Louis, Missouri from April 2 through April 5, 1956.

The Conference Committee consists of the following: Chairman, John E. Bradburn, Production Superintendent, Rural Cooperative Power Association, Elk River, Minnesota; Norman W. Moser, Chief Engineer, Dairyland Power Cooperative, La-Crosse, Wisconsin; REA representative member, W. E. Rushlow, REA, Washington 25, D.C.; Ernest Wickland, Plant Superintendent, Central Power Electric Cooperative, Velva, North Dakota; Robert R. Staten, Chief Engineer, Federated Rural Electric Association, Jackson, Minnesota, and Frank Rose, Border Counties Power Cooperative, Warroad, Minnesota.

Topics to be covered will consist of the following for the diesel group: 1. Turbocharger operation and maintenance; 2. Gas meeting; 3. Water tables and their effect on planning; 4. Air preparation.

Joint sessions with the steam group will cover: 1. Electrical panel on breakers and relaying; 2. Inspection trip through Shell Oil Refinery; 3. Water treatment; 4. Economic loading of units and stations; 5. Atomic power; 6. Safety.

One of the features of the Annual sessions has been the presentation of the DIESEL PROGRESS Efficiency Award. This year Rex W. Wadman, Editor and Publisher of DIESEL PROGRESS, will again make the award to the internal combustion generating plant which operated with the greatest efficiency during 1955.

Sales Manager



J. H. Newton

J. H. Newton has been appointed as sales manager of the White Diesel Engine Division of the White Motor Company according to the recent announcement made by W. F. Burrows, the division's general manager. Mr. Newton received a degree in engineering from the University of Illinois and the Chicago Technical Institute after which he has been associated with the heavy duty diesel engine industry in sales for the past 19 years. He joined the Diesel Engine Division sales activity in Springfield, Ohio, November 15, 1948 and prior to that time he developed a broad background in diesel experience during 12 years association with Fairbanks, Morse and Company. He is active in the Diesel Engine Manufacturers Association as a member of the Diesel Engine Standard Practices Committee, Residual Fuel Committee and equipment. In announcing an agreement to purchase of the American Society of Naval Engineers.

Adds to Earthmoving Equipment

The Reisser Elegrader, well known motor grader

attachment, has become the latest addition to the LeTourneau-Westinghouse line of earthmoving equipment. In announcing an agreement to purchase the entire output of the Reisser Corporation of Blair, Nebraska, officials of the Peoria, Illinois firm point out that this is the most recent step in their program to broaden the line of equipment available through the LeTourneau-Westinghouse distributor organization.

Designed to extend motor grader usefulness, the Elegrader transforms the standard, one man operated, grader into an all purpose tool for loading, casting, terracing, ditching, widening and stripping. Engineered and built for use with the Model

550, 610 and 660 motor graders manufactured by the Adams Division of LeTourneau-Westinghouse the Elegrader has also been adapted for attachment to the Caterpillar No. 12 grader.

How about thinking of getting rid of all that diluted crankcase oil, soupy anti-freeze and light transmission grease as soon as the winter is over.

Dewinterizing has a way of making the engine frisky like a gamboling lamb or you after you make the spring change to B.V.D.s.



EATON VALVES

are Backed by 35 Years of Diesel Engine Experience

Eaton Diesel Engine Valves are produced to meet the exacting requirements of Diesel engine service. Through more than 35 years of co-operating with the country's leading Diesel engine manufacturers, and furnishing valves to them, Eaton has developed a thorough understanding of the problems peculiar to the Diesel field. Eaton's experience is reflected in the outstanding performance records achieved by Eaton-made valves in all phases of Diesel engine service.

Eaton Diesel Valves are produced in a wide range of materials, and in both faced and unfaced designs.

Our engineers will welcome the opportunity to discuss the application of Eaton valves to your engines.



EATON

VALVE DIVISION
MANUFACTURING COMPANY
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PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings • Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamic Drives, Brakes, Dynamometers

West Coast Diesel News

By James Joseph

TO RICHFIELD Oil Corp., a GM 4061-A for auxiliary purposes aboard an offshore vessel. Sale thru Crofton Diesel Engine Co., Inc.

FOR CLYDE EQUIPMENT Co., Seattle, a new Buda HP-351 for repowering a Bucyrus-Erie 15-B shovel operating the Seattle area.

HAMILTON ENGINE SALES, Inc., has delivered to Springfield, Ore.'s Manley Wilson a Buda 6DAS-779, powering a Kenworth 829 rig.

INSTALLED IN THE 80-foot, dragger *Rio Del Mar*, owned by Bel-Hecate Fisheries, Inc., Bellingham, Wash., a GM Tandem Twin 6-71 engine with 5:1

reduction. Sale via Bellingham Engine & Equipment Inc.

FOR CITY OF RIALTO (Calif.) sewage treatment plant, a Buda 6M0672 sewage-gas engine, complete with vapor phase cooling, blowers. By Anderson-BeVier Co., Inc., Los Angeles.

TWO FAIRBANKS-MORSE 45B3½ diesel generating sets have been sold to Honolulu's P.S. Pell & Co.

SAN FRANCISCO's Grace & Co. has taken delivery of a Fairbanks-Morse 45B3½, 3 kw, 5¼ hp diesel.

A GM 8104, twin 4-71 power unit has been delivered for a new log chopper under development in Everett, Wash. (manufacturer's name withheld by request).

FOR THEIR SECOND Quad powered tug, now under construction, a 24003

Quad 6-71 with 6:1 reduction, for Puget Sound Tug & Barge Co., Seattle.

A GM 62203, 6-110 marine propulsion engine has been purchased by Everett, Wash.'s Pacific Towboat Co. for the tug, *Sea Vamp*.

TO SALYERS EQUIPMENT CO., Los Angeles, a Buda 8DC-2505 diesel engine.

HONOLULU'S P.S. Pell & Co. has taken delivery of two additional Fairbanks-Morse 3 kw diesel sets.

TROLLER *Aurora*, out of Seattle, has just repowered with a GM 4-71 diesel engine. Boat's owned by Al Schramen, Seattle.

THE FISHING vessel, *Guide*, owned by Louis Salvesen, Seattle, has installed a GM 6-110 marine engine. Sale via Evans Engine and Equipment Co., Inc., Seattle.

GILBERT HAMILTON's fishing vessel, *Tern*, has been installed with a GM-6-110 marine diesel. Vessel operates out of Seattle.

The 90-FT. FREIGHTER, *Robert Eugene*, Seattle, has installed a GM-6-110 marine diesel. Freighter owned by M. B. Dahl Co.

FOR THE DELPEN Co., 100-ft. freighter, the *Delpen*, a GM 6-110 marine diesel engine.

TO NEWPORT BEACH, Calif.'s Newport Lite-Plant, an F-M model 45B3½, 5¼ hp diesel engine.

TWO MODEL 38D8½, 6 cylinder, 1000 hp marine, direct reversing Fairbanks-Morse engines have gone to Honolulu's P. S. Pell & Co., these additions to Pell F-M's previously reported.

Antarctic Generators

U.S. Navy experts have completed an electric power plant to serve Operation Deepfreeze's main base, Little America V, on Kainan Bay. Five diesel generators, each capable of an output of 30,000 watts will provide power for the 16 house village which has been constructed in the past few weeks by men of a special Construction Battalion. They will also furnish power needed by International Geophysical Year scientists for studies at Little America during the Geophysical Year 1957-58.

In addition to producing electricity, the diesels will serve a subsidiary purpose—melt snow to furnish water for use throughout the village. Exhaust pipes of the diesel engines will be led through

coils in snow-filled reservoirs so that the heat will melt the snow. The power house and all other buildings in the Little America Village are constructed along the same line. A steel framework is laid on a foundation of thick wooden blocks so that an air space is provided underneath the buildings to prevent excessive melting of the foundation snow.

William E. Stroup, chief construction electricians mate, U.S. Navy, son of Mr. and Mrs. Charles G. Stroup of Williamsport, Pennsylvania, will winter over there and superintend operation of the power plant.

Deflection Indicator Bulletin

Allis-Chalmers magnetic amplifier type deflection indicator, applicable to any equipment in which early detection of relative movement is desirable, is described in a new eight-page bulletin released by the company. The indicator is designed to safeguard hydrostations, compressor and pumping stations, drive shafts and other applications. A 60-cycle, 110-volt power source and a suitable location for mounting two compact inductor-coil pickup units are its only requirements.

The indicator offers potentials for both remote and local operation. In either instance, visual or audible alarm systems can be activated to call attention to deflection or motion. Copies of "Deflection Indicator," bulletin 05B8385, are available on request from Allis-Chalmers Manufacturing Company, 961 S. 70th Street, Milwaukee, Wisconsin.

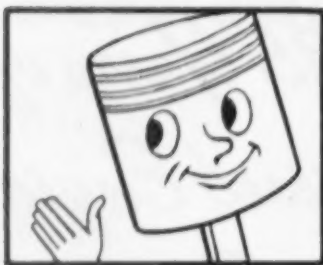
Sales Supervisor

The appointment of Sal Colacuori to the newly created position of sales supervisor, motor truck product development, was announced by R. M. Buzard, manager of sales, motor truck division, International Harvester Company. Mr. Colacuori, since 1948 general supervisor of motor truck sales engineering, has been succeeded in that assignment by N. L. Ginder, sales engineering consultant.

Mr. Colacuori will visit International truck customers, dealers, branches, and districts in connection with his new assignment.

The fellow who is always offering free advice on how to get the best results with your engine is the one who is eternally in a mess with his own heap. After all it is one thing to "talk" a good job and something again to do it right.

STARTS AND STOPS ... sure and safe



KANKAKEE, ILL.—A power shovel dumps the final load of rumbling stone into the last car. The train is loaded. A shout from the rear, then the International UD-1091 diesel



hums louder. The locomotive eases the train to a roll . . . hauls the heavy load of stone on a quick trip from quarry to crusher . . . brakes to a steady, sure stop.

Quincy
COMPRESSORS

QUINCY COMPRESSOR CO.
DEPT. K-48, QUINCY, ILLINOIS

World's finest air compressors

By Cecil Diesel ROVING REPORTER

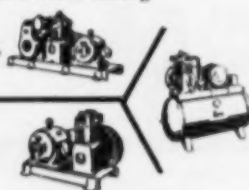
I ask the engineer, "How'd you start and stop so smooth with that heavy load?"

"Easy," he says. "Compressed air operates sander and brakes—and this air is furnished by a QUINCY Compressor." Lehigh Stone Company has found it can rely on its



Model 340 Quincy Compressor . . . for a supply of air that's always there.

And there's a Quincy Compressor to fit every diesel requirement—including horn blowing and engine starting. Let Quincy help you select the right model from a range of mountings and sizes—from 1 to 90 CFM. Write them for a catalog.



Florida Diesel News

By Ed Dennis

FOR PERRINE Construction Co.—one model 2T55 International road scraper with a model HRBI 600 Cummins diesel engine, and one to Atlantic Engineering & Construction Co. of Brunswick, Georgia.

TWO SUPERIOR diesels model MDR6 with Snow Nabstedt r&r gears for the 70 foot yacht *Marcoui*, owned by Fred Edmunds of Ft. Lauderdale.

THE *Jungle Queen* of Ft. Lauderdale, took delivery of a 3MDSP Onan 3 kw diesel generating set with 14 K gold plated fuel oil lines, engine is trimmed in chrome and painted light cream; from Ellis Diesel Sales. Main propulsion is twin GM 6-71s.

AT ST. AUGUSTINE, Diesel Engine Sales Inc., recently launched the trawlers *Miss Jan* and *Bottom Dollar* for Union Fisheries Sales of Biloxi. Both have identical equipment which includes a GM 6-71 diesel with 4.5:1 Allison r&r gears, 46x38 Columbian propeller.

A FAIRBANKS-MORSE diesel for the Fort Bragg filter plant; model 38FS1/4. This 8-cyl. diesel engine is rated 600 hp.

SHELLEY TRACTOR & Equipment Co., Miami, repowered the 65-ft. tug *Warrior* with a D397 Caterpillar diesel rated 450 hp and 5:1 r&r gears for the Peninsular Towing Co., of Port Everglades; for use on inland waterways.

FLORIDA GEORGIA Tractor Co., in Miami delivered a Drott skid shovel model 9K3 to Troup Bros.; powered with a TD9 International diesel.

AT CORAL KEY, a 7½ hp Buda diesel generating set rated 16 hp at 1800 rpm, the discharge water from the heat exchanger which is used to fill and circulate water in a swimming pool. Sold by Peninsular Armature Works Inc., Miami.

FROM GENERAL Engine & Equipment at Tampa, a General Motors 4-51 installed in a Speed Sprayer for spraying citrus trees at the Adams Estates in Auburndale.

A NEW General Motors diesel training center is now located at Atlanta, Georgia, for specialized diesel training courses, sponsored by the local engine distributors and dealers in conjunction with the Detroit Diesel Engine Div.

WELLS BROS., of Key West, had their shrimper, the 7 *Seas* repowered at St. Augustine with a model HM 603 Cummins diesel rated 150 hp and Twin Disc r&r gears. Three more similar installations are to be made in the near future.

TWO MODEL 14 Northwest draglines with Murphy diesels model 12 for Fress Inc. and Rubin Construction Co. of West Palm Beach, from Florida Georgia Tractor Co.

IN JACKSONVILLE, the Gibbs Corp. delivered two D342 Caterpillar diesels with Twin Disc 3:1 r&r gears, one to Harry Xnyides of St. Augustine, the other to the Versaggi Shrimp Co. for the *Voyager* of Tampa.

RECENT GM diesel marine installations include a 6-110 in the 70-ft. *Miss Mary* of Tampa and the *Sea Fever* of St. Augustine. Also a 6-71 for the *Dixie Queen* built by Tileakis Boat Co. of Fernandena Beach.

BUILT AT Tampa by the Steamways Corp., the 73-foot *George M. Bowers* is to be used by the U.S. Fish and Wildlife Service as a fish exploratory vessel. The main engine is a Buda diesel 6DC1879 rated 192 hp at 1200 rpm. For auxiliary power a model 6DAMR273 is used plus a 10 kw Buda diesel generating unit.

AT Jacksonville, two model HRBB-600 Cummins diesels in White hi-way trailers for Southern Trucking Co., plus two NHB-600 Cummins in H. 6 I. T. Mack trailers for M. C. Gallop, also of Jacksonville, Florida.

JOHN W. MARTIN, court appointed trustee of the Florida East Coast R.R., requested to buy 28 new diesel locomotives for \$4,505,580. Permission has been granted by Judge Simpson.

THE *Sea Horse*, Miami Seaquarium's specimen vessel, which is used to collect creatures of the deep sea, was recently repowered from a gasoline engine to a General Motors 4-51 diesel with Paragon 2.5:1 r&r gears. Operation costs dropped from 32 to 8 cents a mile.

Vertical Filter Line

A number of new devices to increase filtering performance and convenience are now available on Industrial's Vertical Filters for chemical and water purification. Filter leaves that can be lifted

from the manifold without unbolting, bottom and top outlet leaves, quick opening cover, jacketed shell, bottom opening filter chamber, and individual leaf outlets are described and diagrammed in a new 8 page folder. In addition to a full description of the vertical filter line, the literature also details air wash, sluicing and shaking devices. Ask for Bulletin 111. Write to Industrial Filter & Pump Mfg. Co., 5916 Ogden Avenue, Chicago 50, Illinois.

Releases New Movie

The Euclid Division of General Motors announces the availability of a new 16-minute sound, color, 16mm movie featuring the Model UD 10-ton rear dump. This film entitled "Under The Shovel" shows the job application and product features of the Model UD, smallest Euclid Rear Dump being manufactured.

It is now available and arrangements

for showings can be made through Euclid distributors or by writing Euclid direct.

Locomotive Ordered

Baldwin-Lima-Hamilton Corp., Philadelphia, Pa., has received an order from The Youngstown Sheet and Tube Company, Youngstown, Ohio, for a 40-ton diesel-hydraulic locomotive. The 0-4-0 unit will be powered by a 300-horsepower, 6-cylinder diesel engine.

THE BIGGEST BUY OF ITS KIND! Bigger, better, completely revised, rewritten and brought up to date. It's Volume 20 of DIESEL ENGINE CATALOG, a volume without equal. Mail orders are being filled for this giant reference book with its all-new, profusely illustrated engine and accessory sections. Be sure of your copy of this fine edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company form orders to DIESEL PROGRESS, Cole Station, Los Angeles 46, California.

Murray & Tregurtha HARBORMASTERS solve tough marine power and steering problems!



Models from 40 to 400 h.p. (Series O-4 illustrated, 40-50 h.p., Gas or Diesel).

You can solve your tough power and steering problems with Harbormaster Outboard Propulsion and Steering Units . . . the complete heavy duty marine power packages. They are quickly and easily installed for immediate use. They are efficient, economical to operate and maintain . . . and they have many special features not found with ordinary marine power, so they are the answer to many tough marine problems.

If you need easily installed power, better steering control, safety in shallow water, easier maintenance, more efficient performance, simpler hull design, more cargo space, bigger payloads, or simplified crew operation . . . you should investigate the benefits of Harbormaster Outboard Propulsion and Steering.

Send for your copy of the new Harbormaster Catalog today. You'll find detailed information and also many interesting Harbormaster installation photos.

MURRAY & TREGURTHA, INC.
QUINCY 71, MASSACHUSETTS

Steer in any direction with full power

Easy service and low operating costs

Protection in shallow water

Rugged, trouble-free performance

SAVE HALF The Cost of New Parts for Your Customer and Shop

Service Available on GMC, Alco, FMD, International, Bendix, Fairbanks-Morse Plungers & Bushings, GM 71 Complete Injectors and Caterpillar Pumps & Nozzles.

Write for Catalog—Become a HANCOCK Dealer.

HANCOCK
DIESEL SERVICE CO.
427 Walnut St. Findlay, Ohio

DON'T REPLACE

Your broken diesel cylinder heads
THEY CAN BE REPAIRED
The GUTH-PASCOE Way

- No matter how badly broken your casting is, it can be repaired the Guth-Pascoe way!
- Guaranteed as good as new and up to the manufacturer's original specifications.
- All ferrous and many non-ferrous castings, simple or complex, can be restored by the Guth Fusion Process.

Investigate GUTH-PASCOE when an emergency arises. A combined experience of 72 years is your guarantee of fine craftsmanship in the restoration of broken castings.

1933 East Washington St., Phoenix, Ariz.
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GUTH-PASCOE COMPANY

For Dependable Lubrication
in Tough Service

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FORCE FEED LUBRICATORS

Engineered to the Specific Needs
of Your Particular Diesels

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HOUDAILLE INDUSTRIES, INC.
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CRANKSHAFTS HARDSURFACED
FACTORY STANDARD SIZE



Write Department B for complete information
and our offer for used, uncracked heavy duty
crankshafts, any undersize.

AMERICAN CRANKSHAFT COMPANY

Charlotte, N. C.

Patented Crankshaft
Reclamation Process

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**DIESEL ELECTRIC
GENERATOR SETS**
20 KW TO 1200 KW



Fairbanks-Morse 1136 KW.
on our test stand.

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DIESEL BROCHURE

DIESEL DIVISION
NATIONAL METAL & STEEL CORP.
Dept. P, 1231 New Dock St., Terminal Island
Sta., Los Angeles, Calif. Phone NEVada 6-2317

New Orleans, April 2-4

Exhibit space for the 28th Annual Technical Session of the Oil and Gas Power Division of ASME in New Orleans is reported completely sold out. The report reached DIESEL PROGRESS just as we were going to press. Scheduled to be held April 2-4 at the Jung Hotel, the event is an important means of discussing and exchanging ideas in the internal combustion field.

Ray Schakel was in charge of the fast-going exhibit space. He is connected with Diamond Chain Company, 407 Kentucky Ave., Indianapolis, Indiana.

The advent of both the REA Managers Meeting and the OGP Sessions during the month of April will make the April DIESEL PROGRESS a convention issue. The distribution and content will make it a great issue to sell diesel products and services.

Gillnet Fisher



The *Agnes B* is a new gillnet fisher put into operation recently by Jakob Bjerkvik of Seattle in waters off the San Juan Islands. Although Bjerkvik started gillnet fishing only this year he has fished off the coasts of Norway and the state of Washington since 1924. His new craft was designed by Edwin Monk, Seattle naval architect and built by the Seattle shipbuilding and Dry Dock Company of Seattle. The boat is of wood construction, measures 34 feet in length, has a beam of ten feet, a draft of five feet and can load up to 10,000 pounds of iced fish.

Evans Engine and Equipment Company of Seattle powered the craft with a General Motors 4-51 diesel with GM hydraulic shift and 2:1 reduction gears. Turning a 26 in. x 16 in. Olympic propeller the engine moves the craft at nine knots.

Honored by AIEE



Gerhard L. Oscarson

Gerhard L. Oscarson, chief application engineer of Electric Machinery Mfg. Company, Minneapolis, has been elected a Fellow in the American Institute of Electrical Engineers. "For engineering development and coordination of design of rotating electric machinery to the changing requirements of industry and national defense." He is one of the country's leading authorities on the development and application of large electric motors, generators and controls. His influence has been responsible for many changes in the design and use of rotating electrical machinery in many industries. Between 1923 and 1927 he was the first to recommend synchronous motors for certain types of metal cold rolling mills. Later he established design characteristics for fully automatic, gas-engine generator stations for oil fields.

A prolific writer and speaker, Mr. Oscarson's books have become standard references for educators, industrialists and consulting engineers.

Names New Service Dept. Manager



Paul Azzolina

Paul Azzolina has been named manager of the service department for the Le Roi Division, Westinghouse Air Brake Co., which has its main plant and general offices at Milwaukee, Wis. Paul I. Birchard, general manager of the Le Roi Division and Westinghouse vice-president, announced Mr. Azzolina's appointment. He was formerly assistant manager of the service department. As manager of the service department, Azzolina will be responsible for supervising field servicing of all Le Roi products, maintaining the parts department, and publication of service bulletins and parts catalogs. Le Roi manufactures Tractairs, air compressors, stationary air compressors, air tools, and internal combustion engines, air tools, and internal combustion engines.

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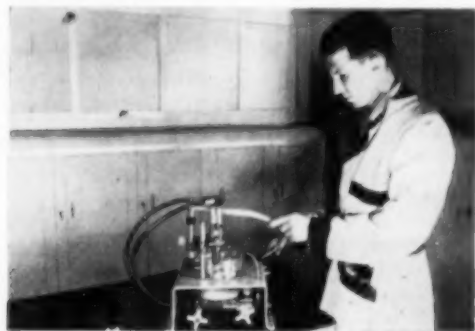
Products sold exclusively through dealer and distributor organizations throughout the United States and Canada. Dealer inquiries welcome

Exceptional Performance



This photo of a Northwest #25 backhoe working on a waterline near Lafayette, Indiana, was taken because the unit's power plant was turning up 15,000 hours of service with an exceptional performance record. According to Russell B. Logan, equipment manager of Russell F. Davis, Inc., of Lafayette, the engine—a General Motors "3-71" Detroit Diesel—has had no parts replaced over this period other than one set of injectors. The dieselized unit was put into service by the Lafayette contractor in 1947.

Injector Tester Fixture



All GM Detroit Diesel injectors can be tested now on one tester with no major change in setup. All six tests: rack freeness, plunger freeness, spray pattern, valve opening pressure, holding pressure and high pressure specified for all Series 51, 71 and 110 engine injectors can be performed on the new Kent-Moore # 7000 injector tester. No special conversion units or individual holding fixtures are necessary for handling.

An important feature of this tester is its adaptability to all of the injectors for these three engines by merely changing the threaded end connectors. Other features include a clear view plastic container that permits safe, unobstructed observation of the spray pattern, a positive lock, fine-adjustment popping handle for greater accuracy in checking leaks at pressures higher than the normal valve opening pressure of the injector, a fine mesh screen and ten-micron filter to guard against fuel system contamination, sturdy 3,000 pound gauge with "lazy" hand for faster testing and oil resistant hoses and nylon-sealed connector fittings to insure long tool life.

The complete J 7000 injector tester includes the basic testing unit (J 5764) plus three adapter sets for testing Series 51, 71 and 110 injectors respectively. The adapters are offered separately for purchase in any combination desired. For complete information, write Kent-Moore, 5-105 General Motors Bldg., Detroit, Mich. **(ITS NEW)**

Diesel Eccentric Valve Seat Grinder



Designed for heavy duty, precision grinding of diesel, gas, or gasoline engines, Hall-Toledo Model EDP has a range of 1½ in. to 6½ in. diameter valve seats. Because of its eccentric "point contact" grinding principle any material can be quickly ground to a fine finish and to within .001 in. of absolute concentricity. A

complete range of pilot and grinding wheel accessories for all types of engines is available. Free literature will be supplied upon request to Hall-Toledo Division, Baker Brothers Incorporated, 138-142 Sylvania Avenue, Toledo 12, Ohio. **(ITS NEW)**

Come to think of it, what was the good of spending so many years devising the best way to turbocharge and supercharge without at the same time finding a way to make men clean air filters to let the air into the charger.

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A design engineer writes about DIESEL ENGINE CATALOG, Volume 20 . . . "It has the attractive make-up and complete presentation for which it has been known and which makes it an excellent source of information."

An accessory manufacturer writes . . . "The model identifications of the various diesel engines will be valuable to us in our efforts to accumulate engine torque specifications."

A top filtration expert writes . . . "... have been through DIESEL ENGINE CATALOG, Volume 20, from cover to cover and can only say I would not think it was possible to make so many improvements over the last issue. It is a magnificent job and I know it will be used frequently by me."

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Announces Increased Production



R. E. Huthsteiner

An immediate 21 per cent increase in engine production over current levels has been announced by R. E. Huthsteiner, president of Cummins Engine Company, Inc., Columbus, Indiana. Mr. Huthsteiner also said that about 10 per cent more factory employees will be needed during the next two months to accomplish this production increase which will raise the daily production of engines to the highest point in the company's history.

Commenting on 1955 business Mr. Huthsteiner said that sales for the year were about 30 per cent over 1954 levels. During 1955 the company spent two and one-half million dollars for new machinery and tools. A major portion of this being for the purchase of machinery for the manufacture of such items as pistons and liners, as well as for the purchase of semi-automatic machinery for the manufacture of cylinder blocks for the new light weight Turbodiesel line.

Looking toward 1956 Mr. Huthsteiner said the company has an engine order backlog which is considerably greater than it was six months ago. Further, he stated that Cummins was also developing a new line of Turbodiesel engines that will enable the company to keep pace with competitive engine manufacturers.

Two Alco Appointments



Arthur A. Batts, Jr.

Two appointments in the advertising, sales promotion and marketing research department have been announced by Alco Products, Inc. Arthur A. Batts, Jr. has been named director of advertising and marketing research, and A. Robert Jaekel has been appointed manager of advertising and sales promotion. Mr. Batts will be responsible for all phases of domestic and foreign product advertising and sales promotion, and for marketing research studies affecting products, markets and distribution methods. He will report to William F. Lewis, vice president of marketing.

Mr. Jaekel, a former member of the Alco advertising staff, will be responsible for product advertising and sales promotion activities under Mr. Batts. Both will make their headquarters at Schenectady.

Probably no one has ever had a better demonstration of the meaning of 'precision bearing' than the man who tried to re-metal one without knowing it can't be done. What he should know is that little success was ever achieved in bearing manufacture until the acceptance of wear as an inevitable manifestation was abandoned in favor of the proposition that proper lubrication on the right kind of metal can eliminate wear.

Chemistry and Engine Cooling

PROBLEMS of engine cooling have never been completely solved but the more troublesome and expensive failures have been, to a large extent eliminated. The most universal method of protection has been to use pure fresh water in a closed cooling system as a means to better control of temperature and a way to keep harmful water impurities away from the metal of the engine jackets. In boats operating on salt water the cheapest and most plentiful supply of coolant is salty sea water regarding which many wrong opinions have existed for years past.

On land where water is always "fresh" the most convenient supply may be very dirty or badly loaded with scale-forming chemicals and more harmful than sea water. On the rivers and other inland waters various hard impurities entrained in the water are scale forming, while in some areas factory waste finding its way into the rivers make the water extremely acid and corrosive. All of this and much more is known in well informed diesel circles. It is also known that closed cooling is a mechanical way of keeping harmful water away from contact with cylinder liners and the jacket space in cylinder heads. It is not a cure-all. It is conducive to effective temperature control. The chemical process of protection is somewhat similar in that a microscopic coat is spread over the area to be cooled and actual water contact with metal is thus prevented. It, too, is not a cure-all. It is often advisable to combine the two systems because the heat exchanger can do things chemicals cannot do and the chemical can act where a heat exchanger system is inadequate.

The chemical process was introduced by the Sudbury Laboratory about 20 years ago but little credence was placed in it until the product, sold under the trade name Aqua-Clear, was used by the armed services as a rust inhibitor for potable water carried in bare steel containers for military use. It is furnished in liquid and crystal form, the latter with a feeder or container for the crystals permitting water to flow over them into the open cooling system. The rate of crystal disintegration is very slow and the replacement cost is negligible. The liquid form is for closed systems. It does not

evaporate. It can be used with permanent anti-freeze but not with alcohol. The product is not a neutralizer. Salt or acid condition of the coolant remains unchanged. Aqua-Clear has the peculiar quality of microscopically coating a surface without building upon itself and forming scale. This protective coat has no detectable effect upon heat transfer. While there is no scale removing characteristic of the chemical itself, the moment that rust and scale formation stops, the erosive action of circulating coolant tends to cause scale to drop off and the newly exposed surface is thereafter protected. In time the jackets clean up except where scale build-up has gotten out of hand and a solvent is required.

With some closed systems of cooling bad conditions of corrosion have been encountered and there was no apparent reason for the trouble. In such cases Aqua-Clear stops corrosion regardless of the cause of the trouble which need not be found.

However, it is obvious that some high concentrations of acidity may penetrate the protective coating set up by the chemical. On boats in harbors, especially where the flotation water is badly contaminated with mud, silt and sewage, the open cooling system carries solids into the jackets and sets up deposits that are extremely harmful and dangerous. Such operation demands the closed cooling system. In many instances the circulation of sea water through heat exchangers has caused expensive replacements of tubes and other parts. A feeder placed ahead of the heat exchanger in the sea water part of the system will prevent damage.

If the engineer encountering cooling trouble, or the designer foreseeing it will have in mind one fundamental of chemical protection through the medium of Aqua-Clear, he can decide whether to use it. This fundamental is a protective coating on the metal without in any way reducing the effectiveness of the coolant. Another matter worth considering is that, in the quantities needed as a rust and corrosive inhibitor, the product is not harmful even in drinking water and it has no tendency to cause dermatitis thus eliminating the need of care in its handling.

Visits Detroit Diesel



Visiting the Detroit Diesel Engine Division on a recent trip through Detroit is Prince Albert of Belgium. He is shown here with S. E. Knudsen (right) Detroit Diesel's general manager as they inspect an engine on the Division's assembly line.

Industrial Catalog Released

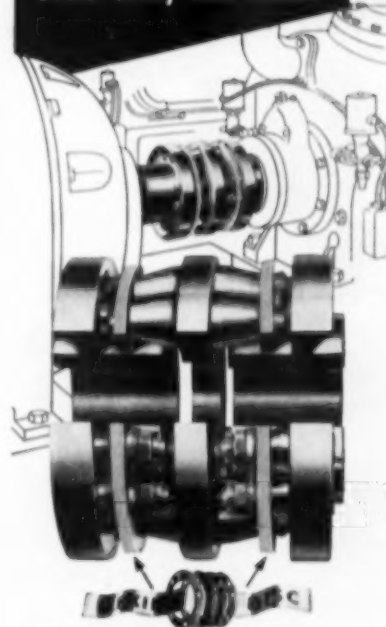
A new 64-page Industrial Catalog has been re-

leased by Aeroquip Corporation, Jackson, Michigan. Designed to be easily read, the fully illustrated catalog is exceptionally easy to use and covers the full range of Aeroquip products. The company manufactures low, medium and high pressure hoses for air, water, fuel, lube and hydraulic applications, as well as special hoses for steam, LP Gas, Freon and fire-resistant hydraulic fluids, and detachable, reusable fittings and couplings. The catalog also provides answers to fluid line problems encountered by designers of machine tools, trucks, construction equipment, engines, farm equipment and hundreds of other industrial products.

Copies of the new Aeroquip Industrial Catalog No. 200 may be obtained by writing to Aeroquip Corporation, 300 South East Avenue, Jackson, Michigan, or in Canada, Aeroquip (Canada) Ltd., Toronto 15, Ontario, Canada.

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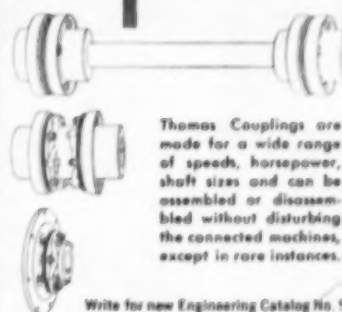
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Write for Bulletin No. 223

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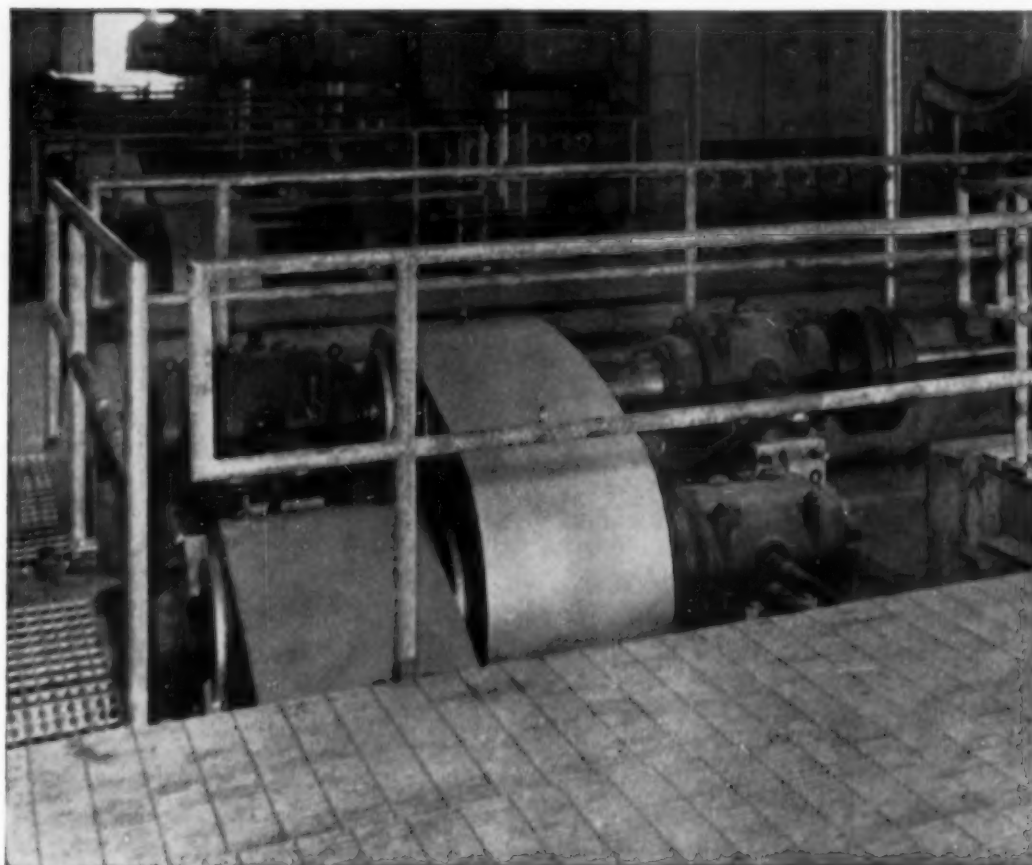
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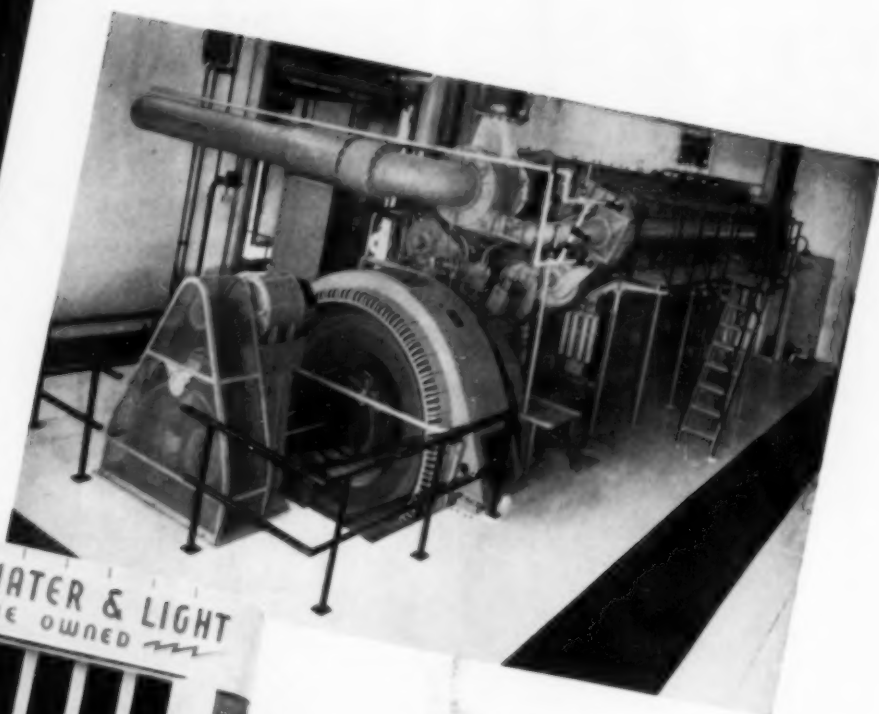
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Above: Latest addition to the Brady, Texas, plant — a 3,550 hp supercharged Cooper-Bessemer LSV-16 Gas Diesel installed in August 1952

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The Brady plant, like so many other efficient municipal plants, is powered with modern Cooper-Bessemer Gas-Diesels, assuring the highest thermal efficiencies known. Brady's latest is a big 3,550 hp supercharged unit installed in August, 1952. Because of its high efficiency it is kept in virtually

24-hour operation. The remainder of Brady's power is supplied by two older tandem-connected Cooper-Bessemers almost as efficient.

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